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CONTENTS

PUBLIC HEALTH REPORTS

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PREVALENCE OF POLIOMYELITIS IN THE UNITED STATES

Reports from the health officers of 43 States for the four weeks ended December 24, 1927, show decreases in the number of cases of poliomyelitis as follows:

	Cases
Week ended December 3, 1927	195
Week ended December 10, 1927	163
Week ended December 17, 1927	118
Week ended December 24, 1927	85

Twenty-four of the cases reported for the week ended December 24 were in the Pacific Coast States. Massachusetts reported 11 cases for that week, Michigan and New York each reported 5 cases, Texas reported 6, and Pennsylvania 4 cases. No other State reported more than three cases of poliomyelitis for the week.

A comparison of the reports for the week ended December 24, 1927, with those for the corresponding weeks of the years 1925 and 1926 shows that poliomyelitis is more prevalent than it usually is in December The following table is based on reports from 42 States:

	Cases
Week ended December 26, 1925	12
Week ended December 25, 1926	12
Week ended December 24, 1927	85

ALASTRIM AND SMALLPOX POTENCY OF SMALLPOX VACCINE

HYGIENIC LABORATORY BULLETIN NO. 149

Hygienic Laboratory Bulletin No. 149, containing two papers which will be of interest to health officers, will soon be issued. It will be on sale by the Superintendent of Documents, Government Printing Office, at 35 cents per copy

The immunological relationship of alastrim and mild smallpox. By James P. Leake and John N. Force Hygienic Laboratory Bulletin 149.

This paper presents the results of some experiments which tend to show the identity of an eruptive disease prevalent in tropical America with the mild smallpox of the United States and Canada. This disease travels under a variety of names, such as varioloid varicella,

alastrim, Kaffir milk pox, Sanaga pox, the Australian disease, Cuban itch, Philippine itch, and so on.

In order to test the relationship of alastrim with mild smallpox, a considerable number of experiments were performed upon monkeys and rabbits. As a result of these immunological tests the authors conclude that the fact that a definite cross-immunity exists between alastrim and mild smallpox, and between alastrim and vaccine virus, is additional evidence of the identity of the two diseases.

A method for estimating the potency of smallpox vaccine. By John N. Force and James P. Leake. Hygienic Laboratory Bulletin No. 149.

It has been held that the potency of smallpox vaccine is self-evident in use and that vaccine of low potency, by the natural process of selection, would be forced off the market. Unfortunately, this has not proved to be the case. Many vaccinations are performed without adequate observation of the results and physicians have had to be content to accept a considerable percentage of failures in vaccination, notwithstanding various methods of vaccination.

In this paper the authors devote attention to the vaccine itself rather than to the manner of administering it, and describe a method of estimating its potency. As a result of their experiments they lay down the criterion that a smallpox vaccine of high potency, when diluted 1 to 1,000, should produce a confluent eruption on from 90 to 100 per cent of the vaccinated area on the back of a rabbit and when diluted 1 to 3,000 the decrease in confluence should not be over 20 per cent. They state that a vaccine satisfying this criterion should produce in all previously unvaccinated persons a circular vesicle measuring at least 7 mm. in diameter on the seventh day when applied undiluted to a circle of the exposed derma measuring 2 mm. in diameter.

THE EIGHTH PAN AMERICAN SANITARY CONFERENCE

Official Report of Resolutions Adopted

(*Acta Final*)

The Eighth Pan American Sanitary Conference initiated its work in the city of Lima on October 12, 1927, at a formal session presided over by the Hon. Pedro José Rada y Gamio, Minister of Foreign Relations of the Republic of Peru, who made the opening address. The delegates of the Republics represented in the conference made appropriate responses, and the temporary chairman of the conference, Dr. Carlos Enrique Paz Soldán, delivered the closing speech of the session.

The first general session of the conference was held on October 13, 1927, Dr. Carlos Enrique Paz Soldán, temporary chairman, presiding.

In conformity with the rules and regulations, the delegates proceeded to elect the permanent president of the conference, and, on motion of the delegates of Uruguay and of the United States of America, Doctors González and Cumming, respectively, Dr. Carlos Enrique Paz Soldán, who had been designated temporary president by the former conference, held in Habana, was unanimously elected. In like manner Dr. Baltazar Caravedo was elected secretary general of the conference.

In compliance with the provisions of the second paragraph of the second article of the rules and regulations, the selection by lot to determine the numerical order of the delegations was effected and resulted as follows:

1. Colombia.
2. Honduras.
3. Panama.
4. Paraguay.
5. United States of America.
6. Guatemala.
7. Bolivia.
8. Dominican Republic.
9. Costa Rica.
10. Venezuela.
11. Haiti.
12. Uruguay.
13. Ecuador.
14. Argentina.
15. Cuba.
16. Brazil.

Drs. Bolivar J. Lloyd, Bento Oswaldo Cruz, and Alfredo Sordelli were elected secretaries of the conference.

The conference resolved to appoint the following committees, apportioning the topics of the program among them in the manner indicated below:

The first committee, entitled "Executive committee and committee on credentials."

The second committee, entitled "Committee on the Pan American Sanitary Code," was assigned topics 1, 17, 25, 26, and 27.

The third committee, entitled "Committee on sanitary organization of the Pan American States," was assigned topics 2, 3, 4, 5, 6, 8, 16, 21, and 29.

The fourth committee, entitled "Committee on epidemiology, sanitation, and prophylaxis," was assigned topics 7, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 22, 23, and 24.

After a report made by the secretary general, Dr. Baltazar Caravedo, the conference definitely approved the credentials of the following-named delegates:

Argentina: Drs. Laurentino Olascoaga, Nicolás Lozano, and Alfredo Sordelli.

Bolivia: Drs. Adolfo Flores and Adolfo Durán.

Brazil: Drs. João Pedro de Albuquerque and Bento Ozwaldo Cruz.

Colombia: Dr. Julio Aparicio.

Costa Rica: Dr. Solón Núñez F.

Cuba: Drs. Fernando Renseli and Mario G. Lebredo.

Ecuador: Dr. Luis M. Cueva.

The United States of America: Drs. Hugh S. Cumming, Bolivar J. Lloyd, and John D. Long.

Guatemala: Mr. Pablo Emilio Cuedes.

Haiti: Mr. Victor Kieffer Marchand.

Honduras: Dr. José Jorge Callejas.

Panama: Dr. José Guillermo Lewis.

Paraguay: Dr. Isidro Ramírez.

Peru: Drs. Carlos Enrique Paz Soldán, Sebastian Lorente, Baltazar Caravedo, Daniel E. Lavarería, and Julio C. Castiaburú.

Dominican Republic: Drs. Ramón Báez Soler and Alejandro Bussalleu.

Uruguay: Dr. Justo F. González.

The United States of Venezuela: Dr. Emilio Ochoa.

The conference unanimously resolved to designate as honorary presidents the Chief Executives of the nations represented.

There were accepted in subsequent sessions, Dr Julio C. Castiaburú as delegate for Nicaragua (that country ranking 17 in numerical order), Dr. Guillermo Angulo Puente Arnao as delegate of Haiti, and Mr. Jaime G. Bennett as delegate of Costa Rica.

The Eighth Pan American Sanitary Conference discussed and adopted the following motions, resolutions, and conventions, namely:

1. The American delegation, assembled in Lima on the occasion of the convening of the Eighth Pan American Sanitary Conference, express their thanks and appreciation to the President of the Republic of Peru, the Honorable Augusto B. Leguía, for the splendid manifestations of hospitality which he has shown them and for the extraordinary progress which has been made in the establishment, materially, of the basic principles of hygiene and sanitation in the Republic of Peru during his administration.

2. The American delegation, assembled in Lima on the occasion of the convening of the Eighth Pan American Sanitary Conference, extend a vote of thanks to the president of the conference, Prof. Carlos Enrique Paz Soldán, for the laudable manner in which he has directed the debates and the work of the conference, and to the organizing committee for the splendid organization effected, and request that this vote be transmitted to the Chancellery of Peru.

3. The Eighth Pan American Sanitary Conference approves the following:

Memorandum Concerning the Interpretation of the Pan American Sanitary Code

By dangerous or contagious disease, referred to in the latter part of article 4 of the Code, is understood all diseases of an epidemic character.

Let it be understood that the obligation to notify "adjacent countries" means all of the American Republics.

With reference to article 9, it shall be understood that the sanitary measures referred to are to be applied to vessels from the infected area.

In the interpretation of articles 11 and 30, it is understood that article 11 refers to the scientific definition of an infected area and article 30 to the standard prescribed by the Pan American Sanitary Code which the sanitary authorities should follow.

Where article 29 reads "autochthonous cases" this should be understood to mean one or more cases.

That in the interpretation of article 35, it is understood that a "clean ship" is one coming from a clean port of class A or B, which, during its voyage, has not had aboard any case of bubonic plague (including rodent plague), cholera yellow fever, smallpox, typhus fever, or any other disease of an epidemic character, and which vessel has strictly complied with the requirements contained in this Code.

Concerning article 41, inset 5, and article 44, inset 3, which refer to human or rodent plague and to smallpox, respectively, it is understood that there is no objection to the application of the measures which the local sanitary authorities may decide upon in each case in view of the special circumstances.

That in cases of doubtful interpretation of the articles of this Code which refer to the application of sanitary measures to vessels, consideration shall be given to the actual conditions found on the vessel in preference to conditions at the ports where the vessel has called.

4. The Eighth Pan American Sanitary Conference reminds all the signatory powers of their obligation to adopt the model bill of health to which article 16 of the Code refers.

5. The Eighth Pan American Sanitary Conference suggests to the signatory or adhering nations the expediency of naming in all ports of entry an official body whose duty it shall be to determine the diagnosis in doubtful cases of contagious disease.

6. The Eighth Pan American Sanitary Conference recommends to the Pan American Sanitary Bureau that it undertake to interest naval architects, and commercial organizations engaged in building or operating vessels, in the rat-proofing of vessels, this to be done in the interest of the organization concerned.

7. The Eighth Pan American Sanitary Conference recommends to the Governments of the American countries the construction of rat-proof wharves—that is to say, wharves of steel and cement—and also that the freight in warehouses be carefully elevated 1 foot above the floor and placed in separate sections in order to leave free spaces for easily guarding against rodents.

8. The Eighth Pan American Sanitary Conference, considering that mortality statistics constitute the fundamental basis of our knowledge of the sanitary conditions of the peoples of America, especially recommends that the Pan American Sanitary Bureau endeavor to put in operation as soon as possible the plan suggested by the Pan American Scientific Congress, assembled in Lima in 1924, namely, that it take appropriate action to the end that all the countries of America which have not already done so adopt the classification of the causes of death now in use in the United States of North America (convention of Paris of 1920), with its methods and procedure, in the compilation of statistics, in order to be able to determine in a systematic manner the comparable mortality rates of the different countries.

9. The Eighth Pan American Sanitary Conference, considering that the placing of sanitary inspectors on vessels, both on the Atlantic and the Pacific coasts, has proved of benefit in facilitating the application of prophylactic measures in the case of vessels calling at infected ports, recommends to the Governments of the American Republics that such inspectors be so placed by any country desiring to do so, and in conformity with its laws and regulations governing the case.

10. The Eighth Pan American Sanitary Conference very respectfully requests of the signatory Governments the faithful observance of articles 3, 4, and 5 of the Pan American Sanitary Code, which constitute the basis of international defense against epidemic diseases of a grave character.

11. The Eighth Pan American Sanitary Conference declares that habit-forming drugs constitute a grave danger to the future of the countries of the American Continent because of their easy dissemination and their pernicious effects on the race, and recommends to the governments of the different States the organization of social defense against habit-forming drugs, establishing repressive, fiscal, therapeutic, and prophylactic measures on the following bases:

(a) Reduction of the cultivation, manufacture, and sale of narcotics, limiting their use to therapeutic necessities and in accordance with the regulations of the sanitary authorities of each country, which shall fix the penalties incurred by infractors;

(b) Reporting of addicts and obligatory treatment in special establishments under restraint, supported by the State and in charge of medical specialists; and

(c) Prophylaxis should also be carried on by education and antinarcotic propaganda.

12. The Eighth Pan American Sanitary Conference reiterates its adherence to that principle of reform of governmental procedure which will prepare the State for the adoption of a definite public policy in matters of hygiene, and declares that only by the establishment of a department dedicated exclusively to medico-social problems

is it possible to make effective to the fullest extent a national or international policy of hygiene and sanitation; consequently, it is recommended that those Governments which have not yet done so should create a department or ministry of health.

13. The Eighth Pan American Sanitary Conference again reaffirms that, for the eradication of bubonic plague, it is necessary to study the complex local problems that its endemo-epidemic character offers in order to determine with precision the factors which contribute to its genesis;

That while these investigations are being made, the campaign against plague should tend to a realization of measures of security against rodents, particularly the rat-proofing of vessels, of dwellings, and, in general, all temporary or permanent habitations of man

The conference recognizes that the destruction of rats can and ought to be continued without cessation, in the hope of reducing their number and subjecting these rodents to biologic control;

That to protect man against the spread of bubonic plague, such biologic control may be usefully employed; and

That this work ought to be done by a central supervising agency.

14. The Eighth Pan American Sanitary Conference, with the object of determining the development and extent of intestinal parasitism on this Continent, recommends to the sanitary institutions of the countries of the Pan American Union that they send reports of such works as are officially recognized as important to the Pan American Sanitary Bureau, which will undertake to outline the geographic distribution of the various intestinal parasites of America.

15 The Eighth Pan American Sanitary Conference recommends to the American Governments that they cooperate by means of laws, decrees, or resolutions in campaigns throughout the entire Continent against venereal diseases, and most respectfully urges said Governments to endeavor by these means to lessen prostitution

That there be established free official clinics for venereal disease, provided with a complete stock of medical supplies, where the public may find treatment within its reach, in order that by this measure the spread of venereal disease may be restricted

16. The Eighth Pan American Sanitary Conference, bearing in mind the participation of the Governments of the American Republics in the International Sanitary Conference held in Paris in June, 1926, to revise the International Sanitary Convention of 1912, is of the opinion that the Pan American Sanitary Bureau should assume and fulfill the duties and obligations of a regional agency for the collection of reports of communicable disease and for the transmission of these reports to the Governments affiliated with the Pan American Union and to the Office International de Hygiène Publique of Paris.

17. The Eighth Pan American Sanitary Conference, in view of the progress attained in the combating of tuberculosis in the different countries and of the experimental methods of immunity now employed, recommends to the Governments that, through the intermediary of their sanitary institutions, they periodically send to the Pan American Sanitary Bureau all data relating to vaccination against tuberculosis, it being the duty of said bureau to summarize the results reported at the next meeting of this conference.

18. The Eighth Pan American Sanitary Conference suggests to the American Governments that they consider the question of prenuptial examination as an adjunct to the prophylaxis of venereal diseases.

19. The Eighth Pan American Sanitary Conference declares that the health and welfare of the laboring class is intimately related to the public health and to the economic development of a country, and that the losses sustained in industry as a result of associated disease cause serious harm to the nation, diminish the actual output of labor, and, above all, are a detriment to the future growth and development of the population, undermining its health, for which reason the conference recommends to the different countries of America the necessity of establishing special agencies within departments of health which shall have charge of everything relating to sanitation in industry in order to place laborers in the best possible environment consistent with their mental and physical capabilities.

20. The Eighth Pan American Sanitary Conference declares that alastrim, so long as its nature is not definitely determined, shall be considered, in so far as international sanitary measures are concerned, the same as smallpox.

21. The Eighth Pan American Sanitary Conference recommends to the American countries that they establish a mutual interchange of all rules, regulations, laws, and sanitary orders, and of all authoritative reports that may be of interest to other countries, sending copies of them to other Republics and, likewise, to the Pan American Sanitary Bureau.

22. The Eighth Pan American Sanitary Conference, in view of the evident desire which exists of holding meetings from time to time of the officers and members of the Pan American Sanitary Bureau, as occasion may require, resolves:

(*a*) That meetings of these officers and members be held in Washington, on call of the director and at intervals of 1 year to 18 months, as circumstances may require; and be it further

Resolved, That hereafter the actual and necessary expenses and the traveling expenses of the members of the Pan American Sanitary Bureau may be paid out of the funds of the Pan American Sanitary Bureau, including a per diem during the period of the conference, an expense which shall not exceed $10 per day, United States currency.

(b) When, in the discretion of the director, a member or representative of the Sanitary Bureau is required to perform any official duty away from his place of residence, the director is authorized to pay out of the funds of the bureau the necessary traveling and other expenses of said representative member, including a per diem, as provided for in paragraph (a) which precedes, during the time in which he is not engaged in travel.

It is understood that salaries shall be paid by the government of the member or representative.

23 The Eighth Pan American Sanitary Conference resolves that, in view of the evident necessity for more direct contact and more perfect interchange of information between the sanitary authorities of the American Republics, there should be established, and there is hereby established, the position of traveling representative, and the incumbent shall be a member ex officio of the Pan American Sanitary Bureau and shall be appointed by the director from among the members of the public health services of the various Republics for such periods of time as the director may deem necessary for the service of the bureau.

24. The Eighth Pan American Sanitary Conference recommends for the study and consideration by the ninth conference the subject of hospital organization as administered in America, and suggests to the Pan American Sanitary Bureau the expediency of preparing a systematic compilation of data obtained from sanitary authorities concerning the status of hospital administration on the American Continent.

25. The Eighth Pan American Sanitary Conference, because of the importance of the subject and in view of the favorable results which have followed the application of modern measures, especially Pasteurization, for the safeguarding of milk, and considering the reduction in infant mortality and also the reduction in mortality in general which have followed the utilization of such measures, recommends to the various Governments that the matter of the safeguarding of milk and the scientific measures for rendering it safe be considered as of paramount importance. In order to secure, in the shortest time possible, the reduction in the number of cases of the various diseases that may be conveyed by milk, it is recommended that the Ninth Pan American Sanitary Conference undertake the drafting of a model law for the safeguarding of this important food.

26. The Eighth Pan American Sanitary Conference, having taken cognizance of the proposed rules and regulations concerning the safeguarding of milk which the special committee appointed by the Peruvian Government has prepared, takes pleasure in declaring that, from a scientific point of view, they fulfill the requirements of safety.

27. The Eighth Pan American Sanitary Conference reiterates its recommendation that in departments of health there be constituted a personnel trained in the work of health and sanitation and selected on the basis of the most perfect fitness, and that there be provided the stimulus of legitimate and gradual promotion in said career, and at the same time recommends the establishment of institutes of hygiene and social medicine for the accomplishment of this object.

28. The Eighth Pan American Sanitary Conference insists on calling the attention of the American Governments to the expediency of continuing the campaign against alcoholism in the manner best adapted to the requirements of each country.

29. The Eighth Pan American Sanitary Conference suggests that for future conferences the Pan American Sanitary Bureau solicit from the Governments of the signatory countries a list of subjects of special interest - a list which should be received by the Pan American Sanitary Bureau at least 18 months before the meeting of the next conference. The said bureau shall examine and classify the subjects proposed, formulating a program of the most important topics, judging from the number of countries that may have submitted them. This program shall be sent to the Governments for their consideration at least one year before the meeting of the ninth conference. On holding the ninth conference, each delegate shall read a résumé of not more than two pages of ordinary paper on the topics of the program which may interest him, without prejudice to his submitting complete observations on the same questions, which observations shall be delivered to the office of the chairman of the conference.

30. The Eighth Pan American Sanitary Conference, having in mind that certain countries of America are giving marked attention to conditions concomitant with their courses in public instruction, including such subjects as (1) the hygienic conditions found in school buildings, (2) teaching methods, (3) sanitary inspection, recommends to all Governments that, considering the social and economic importance of school hygiene in general, they send to the Pan American Sanitary Bureau one year prior to the meeting of the Ninth Pan American Sanitary Conference such reports and instructions as they deem expedient regarding the adoption of measures of reform or of procedure relating to the hygiene of schools, to the end that this subject may be made one of the topics for study by the ninth conference.

Additional Protocol Approved by the Conference (Ad Referendum)

The ratification of the Sanitary Code shall be deposited in the office of the Secretary of State of the Republic of Cuba, and the Cuban Government shall communicate these ratifications to the other signatory States, which communication shall constitute exchange of ratifications. The convention shall become effective in

each of the signatory States on the date of ratification thereof by said State, and shall remain in force without limitation of time, each one of the signatory or adherent States reserving the right to withdraw from the convention by giving in due form a year's notice in advance to the Government of the Republic of Cuba.

The conference, in the session of October 19, 1927, proceeded to designate the seat of the Ninth Pan American Sanitary Conference, having unanimously chosen the city of Buenos Aires, Argentina, as the meeting place of the conference.

The conference proceeded to elect the officers and members of the Pan American Sanitary Bureau of Washington, the following being unanimously elected:

Honorary director, Dr. Carlos Enrique Paz Soldán.
Director, Dr. Hugh S. Cumming.
Vice director, Dr. Mario G. Lebredo.
Secretary, Dr. Sebastián Lorente.
Members, Dr. Solón Núñez F., Dr. Ramón Báez Soler, Dr. Justo F. González, Dr. João Pedro de Albuquerque.

The closing session of the conference was held on the evening of October 20, 1927, Dr. Carlos Enrique Paz Soldán, presiding. At this meeting Drs. Fernando Rensoli and Luis M. Cueva, delegates for Cuba and Ecuador, respectively, and the chairman of the Peruvian delegation, Dr. Sebastián Lorente, made addresses, their remarks being included in the proceedings of the conference.

Done and signed in the city of Lima on the 20th day of the month of October, 1927, and a certified copy delivered to each of the delegations for transmission to their respective countries, a copy to be sent through diplomatic channels to the Department of Foreign Relations of Peru and to the Pan American Sanitary Bureau in Washington.

(Signed) CARLOS ENRIQUE PAZ SOLDÁN,
Chairman of the Conference.

(Signed) BALTAZAR CARAVEDO,
Secretary General of the Conference.

THE FOOD OF CULICINE LARVÆ

FOOD ORGANISMS IN PURE CULTURE

By M. A. BARBER, *Special Expert, United States Public Health Service*

In a previous article (1) I described some experiments on the food of anopheline larvæ where food organisms in pure culture were supplied to larvæ hatched from sterilized eggs. It was demonstrated by these experiments that *Anopheles* may be reared to maturity on bacteria alone, infusoria alone, or algæ alone, provided living food

organisms were supplied them. In the present work I have attempted to repeat with culicine larvæ the same sort of experiments.

The method of sterilizing the eggs of culicines was essentially the same as that employed for *Anopheles* except that eggs united in boats were dissected apart before applying the germicide. Eggs were placed on a sterile cloth spread in a tin spoon perforated by many small holes. Eighty per cent ethyl alcohol was dripped over the eggs for three to five minutes. The eggs were then dried on the cloth to insure their floating when transferred to a liquid medium. The dried eggs were then placed in test tubes containing sterile nutrient broth or sloped agar, a few to each test tube. Larvæ hatched from the eggs were left in the medium for a time, and those which had apparently remained sterile were pipetted to flasks or other larger receptacles containing sterile media suitable for the larvæ and for the living food organisms to be tested.

I obtained culicine eggs by confining gravid females in cages over water or from pools and other waters where egg boats were laid under natural conditions. In some cases receptacles containing rain water were set out and examined daily in order to obtain eggs the day after they were laid.

The eggs withstood the process of sterilization well, as was indicated by the large percentage hatching out after treatment. In one series where eggs of *Culex quinquefasciatus* were treated for five minutes with 80 per cent alcohol and subsequently dried, every one of 124 hatched when transferred to broth or agar. Even eggs that were so far developed that larvæ hatched out within an hour or two after sterilization were apparently unhurt by the alcohol.

A part of the test tubes to which parcels of treated eggs were transferred showed contamination promptly, the proportion of contaminated tubes varying in the different batches. Generally, eggs laid in egg boats gave a larger proportion of contaminated cultures than those laid separately.

In many tubes, however, no contamination appeared although cultures were kept for weeks on a considerable variety of media adapted for bacterial growth. Eggs or young larvæ were tested in glucose and serum broth, on and under the surface of various agars, in anaerobic as well as in aerobic cultures, and at temperatures varied to suit different kinds of contaminants. So far as ordinary bacterial tests can show, sterilization was complete.

Eggs hatched in both acid and alkaline media. Those of *C. quinquefasciatus* hatched in a medium of pH 6.4 and one of 9.4; of *Aedes aegypti*, in pH 6.2 and 8.6, *C. quinquefasciatus* hatched in a medium containing 0.7 per cent salt as well as in ordinary media.

Oxygen appeared to be essential to the hatching of the eggs of the culicine species tested. Eggs embedded in agar or placed in broth

recently boiled under vaseline failed to hatch. Moisture was, of course, essential; but eggs in some tests hatched on the surface of a comparatively dry agar, where they remained dormant until wetted.

Atkin and Bacot (2) have reported experiments where the presence of living bacteria, yeast or molds proved an important, though not necessary, stimulus to the hatching of the eggs of *Aedes ægypti*. In my experiments there was no indication that bacteria promoted hatching in either *C. quinquefasciatus* or *A. ægypti*. Eggs hatched out in water or in clear sterile media as promptly as in contaminated cultures. In a few cases bacteria seemed to encourage the hatching of eggs of *A. sollicitans*, but they were surely not a necessary stimulus. It is true that in my experiments eggs before sterilization usually lay for various periods of time in nonsterile water, in the case of "ripe" egg boats for several days; in other cases they remained only a few hours in clear water, where it seems unlikely that they could have been affected by bacterial growth acting on them before sterilization.

On the other hand, the presence of bacteria in heavily contaminated cultures or of a thick growth of infusoria, bacteria, or yeasts sown in the cultures did not inhibit hatching. Eggs of *C. quinquefasciatus* hatched and the larvæ lived some days almost embedded in a bacterial growth at the bottom of an agar tube.

In a large proportion of the cultures, eggs of *C. quinquefasciatus* and of *A. ægypti* hatched within two or three days after they were laid. In only one or two cases, however, did the eggs of *Aèdes sollicitans* hatch in the media in which they were sown. In one series of 28 tubes, hatching occurred in only one, a control in which the eggs were not sterilized and in which the larvæ appeared in about 10 days. Two weeks after the eggs were sown, bacteria were transferred from this control to seven other tubes of the same batch in which eggs remained unhatched and sterile. In all these tubes hatching was observed on the following day, but it occurred also in three tubes which had not been inoculated with bacteria. Possibly all cultures had been affected by a rise in temperature which occurred at that time.

In another series, eggs of *A. sollicitans* were sterilized and placed on moist sterile earth or sand in test tubes. One month later they were wetted with a medium containing 0.7 per cent NaCl. Five out of nine hatched. Eggs placed in test tubes without earth or sand failed to hatch when wetted with the same medium. It would appear that a resting period of some days favored the hatching of the eggs of this species, but a long resting period was not essential. The presence of bacteria was not a necessary stimulus. Eggs hatched in 0.7 per cent NaCl and in sterilized pool water to which no salt had been added.

Eggs of *Aëdes thibaulti* and of a *Psorophora* (probably *horridus*) failed to hatch although freshly laid and presumably viable. They were placed on a great variety of media, some with bacteria and some sterile, and, in the case of *A. thibaulti*, some with living algæ. The cultures were kept under observation for several weeks.

As in the case of *Anopheles* larvæ, the presence of living food organisms seemed to be necessary to any considerable growth. Larvæ survived a long time in sterile broth; those of *A. quinquefasciatus* for 13 days and of *A. ægypti* for at least 12 days. In neither case did any considerable growth appear. Growth in contaminated cultures was almost invariably better than in sterile ones. Where cultures of bacteria or infusoria were inoculated with the eggs, larvæ showed better growth than in sterile controls in the same medium. The addition of dead microorganisms or of dead organic matter to cultures did not materially promote growth of larvæ. Eggs of *C. quinquefasciatus* hatched in a medium consisting of 0.7 per cent NaCl solution plus human blood cells, but the larvæ did not grow although red blood cells were seen in their intestines.

Culicines reached maturity in media contaminated with bacteria or inoculated with various living microorganisms, and many emergences occurred in test tubes of the ordinary size They throve better than did *Anopheles* in small containers containing a rich medium. But, like *Anopheles*, they found more favorable conditions in such containers as 250 or 500 cubic centimeter Erlenmeyer flasks, pint Mason jars, or large test tubes supplied with a larger amount of a medium less concentrated but sufficiently rich to grow the microorganisms. A very favorable medium consisted of algæ which had been allowed to rot several days at high room temperature, then mixed with water and autoclaved. To this was added a small percentage of nutrient broth, often introduced with the larvæ and with the living microorganisms. The flasks were plugged with cotton and the Mason jars provided with a special cover to exclude bacteria.

The microorganisms used as food for the larvæ were isolated by the single-cell method, or, in the case of some of the bacteria, by plating out. The alga *Scenedesmus*, and the infusorian *Colpidium*, employed in the pure cultures, were the same strains as those used in the experiments with *Anopheles* (1). After the emergence of the adult culicines the cultures were tested for purity by microscopic examination and by transfer of considerable amounts to nutrient media favorable for the growth of contaminants.

A brief description follows of the experiments in which mosquitoes bred on pure cultures of microorganisms emerged living and capable of flight. I must make the same reservation in regard to the purity of the cultures that I made in the case of the *Anopheles*. It is always possible that some contaminant may have been present but failed to

grow on the test media or may have died out during the development of the larvæ. But it is highly probable that the effective microorganism was the one originally inoculated and alone found living at the close of the experiment.

1. *Yeast.*—Fleischmann's yeast was isolated in pure culture and inoculated at the same time with the eggs of *C. quinquefasciatus* into a medium consisting of a meat-extract-peptone-glucose broth diluted with 2 parts of water. About 10 cubic centimeters of the medium was contained in a test tube of ordinary size and kept at high room temperature. Twenty-two days after the hatching of the eggs one small adult emerged. Only yeast appeared in the medium examined microscopically after emergence and in a test culture on agar. In another culture a large amount of pure culture of living yeast was added to sterile water. In this the yeast cells died or became dormant. Growth of larvæ was inconsiderable in this medium. Apparently actively growing yeast cells were more favorable to growth than dead or dormant ones.

2. *Bacteria.*—A small bacillus was used which had been isolated from a contaminated culture in which *Culex territans* had emerged. The medium, consisting of rotten algæ and water, was autoclaved in larger containers; two cultures in 500 cubic centimeter Erlenmeyer flasks and two in pint Mason jars. The reaction of the media in the four cultures was, pH 7.2, 8.6, 8.8, and 9.0. A few cubic centimeters of serum broth or of water of condensation from serum agar were added with the larvæ. Adults of *C. quinquefasciatus* emerged in all four cultures after 11 to 12 days at high room temperature. The mosquitoes were apparently normal; two females from one lot took blood when given the opportunity. Cultures were tested only microscopically after emergence, so that there is a possibility that some species of bacteria other than the one inoculated was present. Here one can be sure only of the fact that the mosquitoes were reared on bacteria alone.

3. *Infusoria.*—In connection with my work on *Anopheles* (1), I grew *Aëdes ægypti* to maturity on *Colpidium* alone. In the present series I obtained nearly full-grown larvæ of this species in a pure culture of *Colpidium;* but in no case did I obtain mature insects on uncontaminated cultures of infusoria. In one culture, consisting of green grass autoclaved with water and enriched by two cubic centimeters of serum broth, I obtained a large healthy adult of *A. ægypti* where the only contaminant proved to be a mold, probably a late invader and of little or no effect on the growth of the larvæ. *Colpidium* alone did not seem to be as good a pabulum for larvæ as when mixed with various bacteria. Larvæ of *C. quinquefasciatus* grew on *Colpidium* alone, and it is probable that this species as well as other culicines could have been brought to maturity on pure cultures had a sufficient number of trials been made.

4 *Algae*.—A nonmotile, unicellular, grass-green alga, *Scenedesmus*, was employed in all experiments. It grew luxuriantly on nearly all media. *C. quinquefasciatus* developed to maturity in a pure culture of this alga in a medium consisting of rain water plus about 5 per cent of serum broth Of 12 larvæ originally placed in this culture, only one, a small male, reached maturity. Although algæ were abundant and a favorable temperature was employed, emergence did not take place until 20 days after the hatching of the eggs. *A. ægypti*, fed on a pure culture of this alga, was also brought to maturity in a medium consisting of rain water plus serum broth. The single larva originally placed in the container, a large test tube, bred out in 16 days. In another culture a larva, bred in the same medium, emerged in 15 days. Algæ alone, even where an abundant growth was present, did not seem to be as good a pabulum for culicines as the colorless microorganisms.

Many adult culicines were obtained in various mixed and contaminated cultures Large specimens of *A. quinquefasciatus* developed in six days from the date of hatching on a mixture of infusoria and bacteria. In a culture of algæ contaminated with bacteria five out of six larvæ of *C. quinquefasciatus* originally placed in the culture reached maturity. The brackish water breeder, *A. sollicitans*, produced healthy adults in media containing 0 7 per cent NaCl and in those containing no more salt than that present in rotten-algæ cultures with or without the addition of earth. They were grown on algæ (one culture) and *Colpidium* (two cultures), in all cases contaminated with bacteria

Of the pure cultures tested, bacteria seemed to furnish the best pabulum, but a mixture of bacteria and infusoria, *Colpidium* or *Paramecium*, seemed to furnish the best medium of all This mixture, as well as the mixture of bacteria and algae, seemed to fulfill the main requirement—a continuous supply of actively growing microorganisms—better than any single food organism

The proportion of adults obtained from a given number of larvæ was greater among culicines than among *Anopheles*, and greater in *A ægypti* than in *C. quinquefasciatus*. Counting only cultures in which at least one adult emerged, I obtained 23 adult *C. quinquefasciatus* from 48 larvæ, and 8 adult *A. ægypti* from 9 larvæ originally sown Considerable variability was observed in the rate of development of larvæ of the same age and grown in the same medium.

Earth, sterilized with the media, was added to a number of cultures, but did not seem materially to promote the growth of larvæ, nor did it prevent the development to maturity of larvæ of *A. ægypti*, a species in nature rarely found breeding next to earth.

The success of cultures did not appear to depend on a close adjustment of the hydrogen-ion concentration. In a culture consisting of

rotten-algæ broth inoculated with bacteria, the hydrogen-ion concentration, originally pH 6.4, rose to 7.2 during the development of *C. quinquefasciatus* to maturity; in another it fell from pH 9.4 to 8.4. In a pure culture of algæ in rainwater plus serum broth, the pH at the time of the emergence of *C. quinquefasciatus* was 5.2. The alga was not in an active state of photosynthesis at the time the pH was determined. In other series in which *A. ægypti* were brought to maturity, the final pH varied from 6.6 to 8.2 in different cultures.

Nearly all cultures were kept at high room temperature, a temperature more favorable to culicines grown in these cultures than to Anopheles.

SUMMARY

Eggs of *Culex quinquefasciatus* and of *Aëdes ægypti* hatched readily in sterile nutrient media. Healthy adults of one or both of these species were obtained in pure cultures of yeast, of infusoria, of algæ, and of bacteria, and in various combinations of these microorganisms. In addition, adults of the *Culex territans* were obtained in cultures of mixed bacteria, and of *Aëdes sollicitans* in infusoria plus bacteria and in algæ plus bacteria. A combination of bacteria with infusoria or with algæ seemed to afford the best conditions for growth. No considerable growth of larvæ was obtained in sterile nutrient media or in cultures provided only with dead organic material.

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PRINCIPAL CAUSES OF DEATH: 1926

The Department of Commerce announces that 1,285,927 deaths occurred in 1926 within the death registration area of continental United States, representing a death rate of 12.2 per 1,000 population, a slight increase over the rate for 1925.

This area in 1926 comprised 41 States, the District of Columbia, and 25 cities in nonregistration States, with a total estimated population on July 1, 1926, of 105,170,000, or 89.8 per cent of the estimated population of the United States.

The principal increases in death rates in 1926 were from diseases of the heart, from 186 to 199 per 100,000 population, influenza, from 30 to 41, pneumonia (all forms), from 94 to 103, measles from 2 to 8, and whooping cough, from 7 to 9.

Decreases in rates in 1926 were from diarrhea and enteritis, under 2 years, from 32 to 27 per 100,000 population, and typhoid and paratyphoid fever, from 8 to 7.

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The following table shows for the death registration area in continental United States in 1925 and 1926 the number of deaths and the death rates per 100,000 population from leading causes:

Cause of death	Deaths in the registration area in continental United States			
	Number		Rate per 100,000 estimated population	
	1926	1925	1926	1925
All causes [1]	1,285,927	1,219,019	1,222.7	1,182.3
Typhoid and paratyphoid fever	6,826	8,287	6.5	8.0
Malaria	2,006	2,132	1.9	2.1
Smallpox	377	709	0.4	0.7
Measles	8,607	2,404	8.2	2.3
Scarlet fever	2,662	2,762	2.5	2.7
Whooping cough	9,317	6,948	8.9	6.7
Diphtheria	7,836	8,058	7.5	7.8
Influenza	42,809	30,538	40.7	29.6
Dysentery	2,921	3,257	2.8	3.2
Erysipelas	2,680	2,455	2.5	2.4
Lethargic encephalitis	1,490	1,680	1.4	1.6
Meningococcus meningitis	1,413	1,095	1.3	1.1
Tuberculosis (all forms)	91,568	89,268	87.1	86.6
Of the respiratory system	80,375	78,103	76.4	75.7
Of the meninges, central nervous system	3,788	3,746	3.6	3.6
Other forms	7,405	7,419	7.0	7.3
Syphilis [2]	16,466	16,332	15.7	15.8
Cancer and other malignant tumors	99,833	95,504	94.9	92.6
Rheumatism	4,219	4,093	4.0	4.0
Pellagra	3,854	3,344	3.7	3.2
Diabetes mellitus	18,881	17,385	18.0	16.9
Meningitis (nonepidemic)	3,219	3,415	3.1	3.3
Cerebral hemorrhage and softening	90,832	87,064	86.4	84.4
Paralysis without specified cause	5,732	5,920	5.5	5.7
Diseases of the heart	209,370	191,226	199.1	185.5
Diseases of the arteries, atheroma, aneurysm, etc.	23,698	23,090	22.5	22.4
Bronchitis	6,961	6,670	6.6	6.5
Pneumonia (all forms)	107,797	96,432	102.5	93.5
Respiratory diseases other than bronchitis and pneumonia (all forms)	9,202	8,875	8.7	8.6
Diarrhea and enteritis (total)	35,296	40,512	33.6	39.3
Diarrhea and enteritis (under 2 years)	28,374	32,450	27.0	31.5
Diarrhea and enteritis (2 years and over)	6,922	8,062	6.6	7.8
Appendicitis and typhilitis	15,751	15,618	15.0	15.1
Hernia, intestinal obstruction	11,734	11,168	11.2	10.8
Cirrhosis of the liver	7,591	7,549	7.2	7.3
Nephritis	103,332	99,320	98.3	96.3
Puerperal septicemia	5,518	5,697	5.2	5.5
Puerperal causes other than puerperal septicemia	9,540	9,618	9.1	9.3
Congenital malformations and diseases of early infancy	75,239	76,158	71.5	73.9
Suicide	13,410	12,495	12.8	12.1
Homicide	9,210	8,893	8.8	8.6
Accidental and unspecified external causes (total)	82,715	80,774	78.6	78.3
Burns (conflagration excepted)	6,487	6,375	6.2	6.2
Accidental drowning	6,661	6,456	6.3	6.3
Accidental shooting	2,583	2,570	2.5	2.5
Accidental falls	14,681	13,864	14.0	13.4
Mine accidents	2,825	2,643	2.7	2.6
Machinery accidents	2,224	2,339	2.1	2.3
Railroad accidents	7,026	6,778	6.7	6.6
Collision with automobile	1,556	1,266	1.5	1.2
Other railroad accidents	5,470	5,512	5.2	5.3
Street-car accidents	1,621	1,630	1.5	1.6
Collision with automobile	464	498	.4	.5
Other street-car accidents	1,157	1,132	1.1	1.1
Automobile accidents (excluding collision with railroad and street cars)	18,871	17,571	17.9	17.0
Injuries by vehicles other than railroad cars, street cars, and automobiles [3]	1,507	1,718	1.4	1.7
Excessive heat (burns excepted)	646	1,355	.6	1.3
Other external causes	17,573	17,475	16.7	16.9
All other defined causes	117,278	114,419	111.5	111.0
Unknown or ill-defined causes	18,708	17,905	17.8	17.4

[1] Exclusive of stillbirths.
[2] Includes tabes dorsalis (locomotor ataxia) and general paralysis of the insane.
[3] Includes airplane, balloon, and motor-cycle accidents.

POLIOMYELITIS CASES REPORTED BY STATES, NOVEMBER 27 TO DECEMBER 24, 1927, AND CORRESPONDING WEEKS OF 1925 AND 1926

The following table is a continuation of the table appearing in the Public Health Reports December 9, 1927, page 3031. It gives the cases of poliomyelitis as reported by telegraph by State health officers for the four weeks ended December 24, 1927. Reports for the week ended December 31, 1927, will be found on page 27 of this issue of the PUBLIC HEALTH REPORTS.

Cases of poliomyelitis reported by State health officers November 27–December 24, 1927, compared with reports for the corresponding weeks of 1925 and 1926

State	Week ended—											
	Dec. 3, 1927	Dec. 4, 1926	Dec. 5, 1925	Dec. 10, 1927	Dec. 11, 1926	Dec. 12, 1925	Dec. 17, 1927	Dec. 18, 1926	Dec. 19, 1925	Dec. 24, 1927	Dec. 25, 1926	Dec. 26, 1925
Alabama	0	2	0	1	0	1	4	0	1	1	3	0
Arizona	0	0	0	0	0	1	0	0	0	1	0	0
Arkansas	3	0	0	1	0	0	1	0	0	0	0	0
California	10	2	2	27	6	4	22	3	3	7	0	2
Colorado	0	1	0	4	0	0	1	0	0	1	0	0
Connecticut	1	0	1	2	0	1	2	1	0	0	1	0
Delaware	0	0	0	0	1	0	0	0	0	0	0	0
District of Columbia	0	0	0	0	0	1	0	0	0	------	0	0
Florida	2	0	0	2	3	1	0	0	0	0	0	0
Georgia	0	0	0	2	0	2	0	0	0	0	0	0
Idaho	1	0	------	1	0	------	1	1	------	0	0	------
Illinois	3	4	3	7	2	2	2	0	5	3	0	0
Indiana	2	0	1	4	0	1	3	1	0	1	0	0
Iowa	0	2	0	2	0	1	8	0	1	3	0	2
Kansas	1	1	0	1	0	1	1	0	1	1	0	3
Kentucky	------	------	------	3	------	------	4	------	------	0	------	------
Louisiana	1	0	1	0	0	1	0	0	0	1	1	0
Maine	1	0	0	2	0	0	2	0	0	2	0	0
Maryland	1	0	0	0	0	0	2	1	0	0	0	0
Massachusetts	24	3	7	24	2	4	11	4	0	11	1	0
Michigan	3	0	0	6	0	0	2	[illegible]	0	5	0	0
Minnesota	4	0	0	2	1	3	0	0	0	1	1	1
Mississippi	1	0	1	0	1	0	1	0	0	0	0	0
Missouri	2	0	2	0	0	1	0	0	0	2	0	0
Montana	1	0	0	0	0	0	0	0	0	1	0	1
Nebraska	1	0	0	5	0	0	2	1	2	1	0	0
New Jersey	2	5	3	1	2	1	2	0	2	1	0	0
New Mexico	2	0	0	1	1	0	0	0	0	2	0	0
New York	19	8	5	6	5	6	6	5	4	5	2	1
North Carolina	0	0	1	2	0	1	0	0	0	0	0	0
North Dakota	0	0	0	1	0	0	1	0	1	------	0	0
Ohio	22	------	------	11	------	------	6	------	------	3	------	------
Oklahoma	3	1	2	2	1	1	1	1	0	0	1	0
Oregon	26	0	0	13	1	1	10	0	0	10	0	0
Pennsylvania	13	2	1	8	1	------	6	1	1	4	2	1
Rhode Island	2	0	0	0	1	0	1	0	0	0	0	0
South Carolina	3	0	1	1	1	------	3	1	0	3	0	0
South Dakota	3	1	1	1	0	0	0	0	0	2	0	0
Tennessee	3	0	1	2	1	0	0	0	1	0	0	0
Texas	10	2	0	7	1	0	5	0	0	6	0	0
Utah	1	0	0	2	0	0	0	0	0	0	0	0
Vermont	0	0	2	------	0	2	0	0	0	0	0	0
Virginia	0	0	0	0	0	0	0	0	0	0	0	0
Washington	17	0	1	5	0	1	10	0	0	7	0	0
West Virginia	4	0	0	8	0	0	3	0	0	0	0	0
Wisconsin	3	0	1	0	0	2	0	0	3	0	0	1
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	195	34	37	167	31	40	123	20	25	85	12	12

PUBLIC HEALTH ENGINEERING ABSTRACTS

The Ventilation and Heating of Factories. II. M. Vernon and T. Bedford assisted by C. G. Warner. (*J. Indust. Hyg. 1927*, v. 9, 51–60.) From *Bulletin of Hygiene*, vol. 2, No. 7, July, 1927, pp. 539–540. (Abstract by P. S. Lelean.)

"The authors summarize usefully, for American publication, the results of their research for the British Industrial Fatigue Research Board (see Bulletin of Hygiene, v. 2, p. 180).

"1. Natural ventilation of large workrooms nearly always, especially in summer, needs to be aided by mechanical extraction of air; natural extraction amounts to only 10 per cent of that by fan, and may fall to zero or even be reversed. Heating by overhead steam pipes is condemned and application of heat beneath the floor is recommended.

"2. Mechanical ventilation, especially by the plenum (propulsion) system, is rapidly being generally adopted owing to its control facilities. Warmed air is forced into rooms through inlets of 5½ per cent floor area, the inlets being multiple, small, and low, so that the feet are warmed and the head kept relatively coo by the delivered warm air rising to escape by window exits at or above head levell of the workers.

"3. Practicable ideals may be thus tabulated:

	Summer (70° F.)	Winter (40° F.)
Cooling power of air (dry-katathermometer)	6	7
Air velocity (in feet per minute)	100	30
Air changes per hour	6	2

"Excess of temperature of air at head level over that at foot level less than 2° F.

"4. There is quoted the finding of the New York State Commission which investigated the conditions affecting the health of school children in America—'The avoidance of overheating is the primary essential,' and this dictum, which can not be too well known, is supported by observations showing that an increase of 7° over the optimum working temperature of 60° F. is associated with a 32 per cent increase in time lost by sickness among the workers."

Report of Bureau of Sanitary Engineering, Maryland State Department of Health, 1926. 19 pages. (Abstract by I. W. Mendelsohn.)

Air pollution.—(1) Hydrogen sulphide is being removed from coke-oven gases without odors; (2) at a reduction plant the drier gases are treated in a scrubber, all gases passing up through thin layers of excelsior while being sprayed with water; the gases are then dosed with liquid chlorine at the rate of 14 to 18 pounds per day; (3) an investigation was made into the effectiveness of treating all exhaust gases from a rendering plant after washing, 50 to 75 pounds of liquid chlorine per day being used; (4) carbon monoxide poisonings in a steel plant are under investigation.

New Water Filtration Plant at Wenatchee, Wash. Fred J. Sharkey and S. DeMoss. *Western Construction News*, vol. 2, No. 19, October 10, 1927, pp. 56–58. (Abstract by E. A. Reinke.)

A new 4 m. g. d. rapid sand gravity filter plant has recently been constructed as the first unit of a plan which provides for a normal capacity of 12 m. g. d. The intake in the Columbia River is constructed of reinforced concrete, 39 feet 6 inches long, 16 feet wide at the base, and 36 feet high. As the Columbia remains high only a few weeks in the year the gate control is housed in a compartment at the top and water allowed to flow over. The intake has inlets at several levels and serves as a sand trap. The sedimentation basin is 70 by 130 by 14 feet deep, divided into two equal compartments with a mixing chamber in each compartment equipped with motor-driven agitator. An interesting feature of this basin is that the roof slab was constructed to allow its use for a tennis court. The

filter and head house is built over the clear well, the first floor housing switchboard, meters, and high lift pumps; the second, offices, laboratory, dry feed machine room, and shops; the third providing chemical storage with a wash water tank 7½ feet deep above. Four 1 m. g. d. filter units are provided. Alum is used for coagulation. The cost totaled $221,500.

Recreational Use of Watersheds. C. G. Gillespie. *Western Construction News*, vol. 2, No. 19, October 10, 1927, pp. 59–60. (Abstract by E. A. Reinke.)

After reviewing recent events in New Jersey where resort owners and others succeeded in having a bill passed by the legislature legalizing swimming in all waters of New Jersey, the author presents an argument for promoting the reasonable attitude among waterworks men and recreational users of watersheds. He states that the self-interest of the recreationists will demand decent and reasonably clean conditions on watersheds and concludes with the following paragraph: "This widespread recreation development is a new problem upon water departments and upon public officials. It will be a mistake to let down the bars, however, as long as there are numbers who would become careless. On the other hand it is my opinion that the greatest good to all concerned will come from a gradual raising of the standards among the recreationists themselves. To such a program waterworks men can with profit undoubtedly lend their support."

New Orleans' New Filter Plant. Anon. *Public Works*, vol. 58, No. 10, October, 1927, pp. 398–399. (Abstract by W. J. Downer.)

Plant still under construction; one filter unit placed in operation about first of this year. New installation includes eighteen 4,000,000-gallon filters, equalization reservoir underneath filters, 2 grit, 2 lime mixing, and 4 coagulating basins, pumps and other necessary equipment. All structures rest on piles. Grit basins to be twice as long but same width as previous ones.

Baffles in coagulation basin are arranged to provide about twice the area on incoming side as on outgoing because past experience shows fully 90 per cent of suspended matter precipitates in first part of basin.

Most radical change in filters is new type of underdrain system. Advantages claimed are: It places construction entirely above bottom of filter, takes up small headroom, gives uniform distribution of wash water, costs considerably less than former type ($1,500 to $2,000 less per 4,000,000-gallon unit) and is expected to be less difficult to maintain. Bank sand of approximately 0.35 mm. effective size and 1.65 uniformity coefficient used.

The Relation of Endemic Goiter to the Iodine-Content of Soil and Drinking Water. R. McCarrison, C. Newcomb, B. Viswanath and R. V. Norris. *Indian Journal of Medical Research*, vol. 15, No. 1, July, 1927, pp. 207-246. (Abstract by L. M. Fisher.)

This study relates only to the classical type of endemic goiter described by the older writers as occurring in the Alps and other mountainous regions in association with cretinism, deaf-mutism and idiocy and which were studied by the authors in Himalayan India.

The distinctive epidemiological characters are: It has its home in high mountain ranges; prevails with different degrees of intensity in different parts of the same region and at different times; it has made its appearance in new places and disappeared from others; is especially prevalent in agricultural or pastoral districts, but is also rife in many towns; is commoner among the poor than the rich and especially among the agricultural laborers; has a seasonal endemicity, being higher in the spring; epidemics may occur among newcomers, such as school children and troops; there is a family predisposition; in regions of low endemicity it is commoner among females than males while in regions of high endemicity this disproportion disappears.

The freedom of localities in ex-Himalayan India is related to conditions other than the iodine content of their soils.

Drinking water containing 300 parts of iodine per 100,000,000,000 parts of water has not prevented endemic goiter in the presence of a high degree of bacteriological impurity in the water. Bacteriological impurity of a water supply combined with unhygienic conditions of life of the people is stated to be the essential cause of the disease. A deficiency of iodine favors its development.

Iodine-containing salt or substitutes therefore appear to prevent this type of endemic goiter, but under certain circumstances fails to do so.

Several methods of determining the iodine content of soils and water are given; also a bibliography.

Effluent Aerators Control Mechanical Filters. Malcolm Pirnie. *Engineering News-Record,* vol. 99, No. 10, September 8, 1927, pp. 376–380. (Abstract by C. G. Gillespie.)

The article describes the secondary aeration of filtered water ahead of the clear water basin at Providence, R. I., West Palm Beach, Fla., Poughkeepsie, N. Y., and Rahway, N. J. The available head between filters and clear well, variable according to the cleanliness of the filters, is utilized for aeration to reduce carbonic dioxide, taste, and odor. Amount of reduction of CO_2 as reported is 32 per cent, 41 per cent, 39 per cent, and 62 per cent in the several plants.

A controller adjusts the nozzle openings to maintain the filtered output. At Poughkeepsie the aeration is between the mechanical scrubbing filters and final slow sand filters. At Rahway the water is chlorinated ahead of the clear water reservoir and after contact with chlorine for several hours is aerated between the clear water reservoir and a high lift pump suction, taking advantage of the fact that the water level in the former basin is usually 10 feet above that in the latter. The aeration expels excess chlorine, and the water is now free of tastes and odors besides being less corrosive. Greater aeration efficiency would result from washing at a lower loss of head than customary. It remains to be seen how far it is reasonable to go to secure the secondary aeration and the additional CO_2 and odor removal.

Malaria in the Philippines. Walter V. D. Tiedeman. *Journal of Preventive Medicine,* vol. 1, No. 3, 1927, pp. 205–254. Translation of an abstract by Martini in *Zentralbl. fur die Gesamte Hygiene,* vol. 15, August 25, 1927, p. 654.

In the Provinces of Laguna and Pampanga, endemic malaria occurs in moderation and is generally more prevalent in the vicinity of the rivers, in the foothills, and along the borders of uncultivated lands. There are seasonal variations in the occurrence of malaria, attributable to the dry seasons during which river-breeding types such as *Anopheles ludlowi* and *minimus* predominate. To what extent the apparent relapses of cases are classed as new infections can not be stated; the possibility often exists. On the other hand, the treatment is frequently insufficient. The death rate is not excessive. The deaths credited to malaria are too great, since frequently other causes of death are reported as due to malaria. Nevertheless malaria is of serious consequence. *Anopheles barbirostris, fuliginosus, sinenis, kochi, ludlowii, maculatus, philippinensis, tessellatus, subpictus,* were found, but no tree-hole breeders. On farm lands, irrigation and drainage ditches were the only breeding places. Most species propagate without interruption. Only *ludlowii* and *minimus* show seasonal fluctuation as river breeders. The rice-field types such as *A. sinensis* are mostly harmless. The people are readily accessible to the Anopheles because of the type of their houses, and carriers are widely distributed. Quinine prophylaxis is only possible under military discipline. However, much can be accomplished for the thickly settled regions with Paris green and intelligent use of the irrigation ditches and at relatively low cost. For the thinner populated areas, where the malaria rate is lowest, these methods of control are too expensive.

The Control of Malaria in Malaya. Regular London Correspondent, *Journal American Medical Assn.*, vol. 89, No. 7, August 13, 1927, p. 534. (Abstract by C. H. Kibbey.)

The Malayan campaign against malarial fever was almost the first begun, and has been the most persistent, the widest, and the most successful of malaria-control campaigns in British areas –perhaps in the world. Selangor, a town of 3,576 inhabitants, is contained in an area of 290 acres, of which 22 acres were swamp and 85 jungle or dense growth. The annual fever death rate stood at 300 per thousand inhabitants, as against the English death rate of 11 or 12. The swamp was drained and the work of mosquito control was begun. This work from 1901 to 1905 cost about $20,000, and during the same period $30,000 was spent on malaria control at the neighboring town of Port Swettenham. The work of malaria prevention in Malaya has progressed until to-day it has become a part of the life of the whole community. The result is that the death rate of Singapore has fallen since 1911 by nearly a half. The whole population of Malaya has learned the value of the campaign against malaria and has become united in supporting that campaign. Laws have been passed imposing on every one the duty of taking preventive measures in the home. It has become a crime to neglect such precautions as the emptying of vessels containing water and the drainage of puddles or other breeding places of mosquitoes.

Measures of Outstanding Importance in the Prevention and Control of Malaria. M. A. Stuart. *U. S. Naval Bulletin*, vol. 25, No. 4, October, 1927, pp. 996–1010. (Abstract by H. E. Hargis.)

The occasion for the writing of this paper was the quartering in Olongapo of 450 marines, nearly all of whom had malaria in about six weeks. The methods of prevention and control are listed as: (1) Elimination of breeding places by filling in and drainage; (2) destruction of larvae through oiling, larvicides, and the use of *Gambusia affinis;* (3) destruction of adult mosquitoes by fumigation and capture; (4) protection of persons from mosquitoes by screening and bed nets; (5) segregation of nonimmunes from unprotected native villages; (6) medicinal prophylaxis by the routine use of quinine. Authorities are quoted on the application of these measures and each measure is taken up in detail.

The Possibilities of Paris Green as An Anopheles Larvicide. B. S. Chalam. *Indian Journal of Medical Research*, vol. 14, No. 4, April, 1927, pp. 867–873. (Abstract by L. M. Fisher.)

Paris green—aceto-arsenite of copper—is also known in Europe as Schweinfurt green. In the experiments carried out by American workers no attempts were made to remove vegetation.

Before applying the Paris green, larvae averaged 11.1 per dip. Afterwards they averaged 0.5 larvae per dip and the surviving larvae were very small. Fifteen grains to 10 square yards of water surface are deemed sufficient unless in very dense vegetation. The material was applied with unskilled labor either by hand or using a hand bellows.

The Resistance of Anopheles Eggs to Desiccation. B. S. Chalam. *Indian Journal of Medical Research*, vol. 14, No. 4, April, 1927, pp. 863–866. (Abstract by L. M. Fisher.)

Eggs of *A. subpictus* and *A. stephensi* were found to be viable after desiccation up to a period of 12 days. They hatched normally and some grew to maturity.

(Abstractor's note: This study was apparently suggested by Mayne's paper, "Notes on the influence of temperature and humidity on oviposition and early life of Anopheles," Public Health Reports, vol. 41, part 1, 1926, p. 986. Mayne found that the eggs of *A. quadrimaculatus* were viable after periods of desiccation up to 16 days, and *A. crucians* after periods of desiccation up to 21 days.)

DEATHS DURING WEEK ENDED DECEMBER 24, 1927

Summary of information received by telegraph from industrial insurance companies for the week ended December 24, 1927, and corresponding week of 1926. (From the Weekly Health Index, December 29, 1927, issued by the Bureau of the Census, Department of Commerce)

	Week ended Dec. 24, 1927	Corresponding week, 1926
Policies in force	69, 620, 546	66, 348, 549
Number of death claims	12, 481	11, 629
Death claims per 1,000 policies in force, annual rate	9. 3	9. 1

Deaths from all causes in certain large cities of the United States during the week ended December 24, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926. (From the Weekly Health Index, December 29, 1927, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Dec. 24, 1927		Annual death rate per 1,000 corresponding week 1926	Deaths under 1 year		Infant mortality rate, week ended Dec. 24, 1927 [2]
	Total deaths	Death rate [1]		Week ended Dec. 24, 1927	Corresponding week 1926	
Total (69 cities)	7,412	12. 9	[3] 12. 7	755	[4] 730	[4] 60
Albany [5]	44	19. 2	14. 9	3	1	63
Atlanta [6]	92	19. 3	16. 2	9	10	
White	56	16. 7	13. 1	4	6	
Colored	36	25. 4	23. 6	5	4	
Baltimore [5] [6]	227	14. 5	15. 0	30	19	95
White	175	13	13. 7	26	11	103
Colored	52	22. 5	22. 3	4	8	63
Birmingham [6]	66	15. 8	13. 9	11	3	
White	28	11. 0	9. 4	3	1	
Colored	38	23. 4	20. 8	8	2	
Boston	203	13. 3	17. 1	20	28	56
Bridgeport	38			2	1	34
Buffalo	137	13. 0	11. 4	15	14	63
Cambridge	34	14. 3	11. 1	2	3	36
Camden	32	12. 5	16. 3	4	7	68
Canton	17	7. 8	6. 6	1	2	24
Chicago [5]	735	12. 4	11. 1	71	77	62
Cincinnati	151	19. 1	14. 0	14	3	85
Cleveland	198	10. 6	10. 4	19	19	51
Columbus	84	15. 0	14. 8	5	5	46
Dallas [6]	55	13. 6	10. 5	6	1	
White	46	13. 0	10. 1	5	3	
Colored	9	17. 1	13. 7	1	1	
Dayton	40	11. 5	15. 1	2	6	33
Denver	97	17. 5	13. 0	9	8	
Des Moines	33	11. 6	15. 7	2	4	35
Detroit	269	10. 5	11. 8	45	50	69
Duluth	22	10. 0	7. 9	2	2	43
El Paso	30	13. 8	10. 0	3	8	
Erie	23			2	4	43
Fall River [5]	19	7. 5	14. 7	3	1	51
Flint	29	10. 6	6. 5	7	4	110
Fort Worth [6]	34	10. 8	11. 5	2	4	
White	25	9. 1	11. 2	1	3	
Colored	9	23. 9	13. 5	1	1	
Grand Rapids	25	8. 1	10. 7	3	6	44
Houston [6]	87			10	4	
White	59			8	3	
Colored	28			2	1	
Indianapolis [6]	109	15. 2	13. 4	5	6	38
White	90	14. 2	13. 1	5	4	43
Colored	19	22. 1	15. 6	0	2	0
Kansas City, Kans. [6]	42	18. 6	12. 9	4	2	84
White	31	16. 8	13. 0	4	1	99
Colored	11	27. 1	12. 7	0	1	0

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 68 cities.
[4] Data for 61 cities.
[5] Deaths for week ended Friday, Dec. 23, 1927.
[6] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended December 24, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926—Continued.

City	Week ended Dec. 24, 1927		Annual death rate per 1,000 corresponding week 1926	Deaths under 1 year		Infant mortality rate, week ended Dec. 24, 1927
	Total deaths	Death rate		Week ended Dec 24, 1927	Corresponding week 1926	
Kansas City, Mo	101	13.7	13.1	10	8	
Knoxville [5]	26	13.3		7		
White	23	13.3		7		
Colored	3	12.8		0		
Los Angeles	216			24	21	68
Louisville [6]	81	13.2	12.6	1	5	8
White	66	12.7	11.9	0	1	0
Colored	15	16.0	16.5	1	1	69
Lowell	23	10.9	11.3	2	3	42
Lynn	27	13.4	10.0	2	1	55
Memphis [6]	80	23.3	18.6	7	6	
White	32	14.4	13.3	2	3	
Colored	48	39.5	28.1	5	3	
Milwaukee	116	11.3	10.6	14	11	64
Minneapolis	73	9.5	11.1	8	6	45
Nashville [6]	48	18.2	16.4	7	5	
White	23	12.1	11.7	3	3	
Colored	25	33.5	28.1	4	2	
New Bedford	27	16.1	12.2	2	2	38
New Haven	43	12.1	13.2	5	0	70
New Orleans [6]	168	20.6	20.0	20	18	
White	93	15.4	11.6	11	8	
Colored	75	35.5	35.4	9	10	
New York	1,341	11.7	12.8	135	138	56
Bronx borough	177	10.0	9.2	14	12	45
Brooklyn Borough	467	10.7	10.9	52	46	54
Manhattan Borough	518	15.7	17.9	56	68	67
Queens Borough	114	7.3	8.9	7	10	30
Richmond Borough	35	12.4	17.6	6	2	113
Newark, N. J	104	11.6	10.8	4	11	20
Oakland	55	10.7	11.4	5	8	59
Oklahoma City	23			3	3	
Omaha	45	10.7	11.6	4	5	47
Paterson	38	13.8	11.0	1	4	18
Philadelphia	491	12.6	14.1	46	56	89
Pittsburgh	179	14.0	12.1	21	19	73
Portland, Oreg	59			0	3	0
Providence	71	13.8	11.6	5	6	43
Richmond [6]	60	16.3	16.8	4	6	52
White	28	10.7	15.2	2	3	40
Colored	32	30.0	20.7	2	3	73
Rochester	96	15.4	11.1	12	7	102
St. Louis	209	13.0	13.6	27	22	
St. Paul	57	11.9	9.2	4	2	37
Salt Lake City [5]	34	13.1	12.9	3	5	48
San Antonio	58	14.3	14.0	11	6	
San Diego	51	23.1	21.7	3	2	66
San Francisco	187	16.9	14.2	8	6	50
Schenectady	21	11.7	10.1	4	3	120
Seattle	75	10.4	10.4	1	4	11
Somerville	11	5.6	15.1	1	2	29
Spokane	29	13.9	13.4	0	7	0
Springfield, Mass	32	11.3	13.3	7	6	111
Syracuse	62	16.4	12.7	5	4	65
Tacoma	27	13.1	11.8	2	4	47
Toledo	81	13.8	13.1	5	8	48
Trenton	42	16.0	10.5	7	3	124
Utica	29	14.6	16.3	2	3	47
Washington, D. C. [6]	129	12.5	11.5	9	9	53
White	78	10.1	11.6	4	7	34
Colored	51	19.5	10.9	5	2	91
Waterbury	28			1	1	23
Wilmington, Del	31	12.8	9.2	0	1	0
Worcester	50	13.3	12.4	2	4	24
Yonkers	31	13.6	9.9	7	3	161
Youngstown	36	11.1	9.8	8	5	106

[5] Deaths for week ended Friday, Dec. 23, 1927.

[6] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 1, 1927, and December 31, 1927.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 1, 1927, and December 31, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 1, 1927	Week ended Dec 31, 1927	Week ended Jan. 1, 1927	Week ended Dec 31, 1927	Week ended Jan 1, 1927	Week ended Dec 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927
New England States.								
Maine	5	9	13	2	112	25	0	0
New Hampshire		1		32		1		0
Vermont	1				51		0	0
Massachusetts	121	135	17	11	122	648	0	1
Rhode Island	13	11	12	6	1	3	0	0
Connecticut	34	40	13	12	28	55	1	0
Middle Atlantic States								
New York	274	349	[1] 60	[1] 14	948	636	5	3
New Jersey	144	180	32	19	49	115	1	0
Pennsylvania	187	377			523	1,048	0	3
East North Central States:								
Ohio		115		8		104		2
Indiana	86	35	66	27	117	28	1	0
Illinois	110	176	32	30	823	26	6	2
Michigan	116	150		2	107	407	0	5
Wisconsin	53	63	30	46	579	39	8	6
West North Central States:								
Minnesota	38	29		1	96		0	0
Iowa [2]	20	15			91	4	0	1
Missouri	60	[4] 42	22	[4] 1	70	[4] 21	0	[4] 2
North Dakota	2				98		0	
South Dakota	8	2		4	86	10	0	0
Nebraska	15	18	6		35	11	1	1
Kansas	25	31	18	2	76	9	2	1
South Atlantic States:								
Delaware		4			1	6	0	0
Maryland [2]	44	46	36	20	21	109	1	0
District of Columbia	20				1		0	
Virginia								
West Virginia	25	17	47	19	61	60	0	0
North Carolina	53				88		1	
South Carolina	32	28	696	829	30	769	0	0
Georgia	41	13	81	137	37	69	0	0
Florida	43	21	24	15	10	8	0	0

[1] New York City only. [2] Week ended Friday. [4] Exclusive of Kansas City.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 1, 1927, and December 31, 1927—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927
East South Central States:								
Kentucky		33		24		47		0
Tennessee	23	17	45	88	16	194	1	3
Alabama	45	62	55	163	27	158	4	1
Mississippi	17	16					1	
West South Central States:								
Arkansas	12	12	83	136	1	27	0	0
Louisiana	22	[5] 5	9	[5] 7	38	[5] 35	0	[5] 0
Oklahoma [3]	33	75	181	102	46	29	0	1
Texas	61		49		4		1	
Mountain States:								
Montana	3	8			137		2	2
Idaho	1	[illegible]	1		54		1	0
Wyoming	2				75	9	0	5
Colorado	7	6	5	1	20	4	1	1
New Mexico	3	4			11	19	1	0
Arizona	1	41		1	6	18	0	5
Utah [2]	8	4	2	6	367		0	2
Nevada								
Pacific States:								
Washington	24	13			164	146	0	8
Oregon	13	7	42	30	30	21	0	1
California	123	111	36	25	753	31	2	1

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927
New England States:								
Maine	0	2	17	39	0	0	1	4
New Hampshire		0		13		0		0
Vermont	0	0	2	8	0	0	0	0
Massachusetts	1	9	405	286	0	1	19	3
Rhode Island	0	0	14	33	0	0	0	1
Connecticut	1	0	82	75	0	1	5	0
Middle Atlantic States:								
New York	5	4	505	726	14	14	27	25
New Jersey	0	0	240	187	0	7	4	2
Pennsylvania	0	2	524	548	0	0	31	20
East North Central States:								
Ohio				225		9		28
Indiana	0	1	213	62	131	82	2	2
Illinois	0	3	286	313	31	39	26	18
Michigan	0	1	321	383	26	41	8	14
Wisconsin	0	1	118	155	17	27	4	2
West North Central States:								
Minnesota	1	1	224	109	2	2	3	4
Iowa [4]	0	0	93	58	22	56	0	0
Missouri	0	[4] 0	102	[4] 47	5	[4] 31	3	[4] 3
North Dakota	0		29		0		0	
South Dakota	0	0	68	22	10	8	1	2
Nebraska	0	1	46	63	28	6	4	0
Kansas	1	1	97	117	37	45	3	4
South Atlantic States:								
Delaware	0	0	34	2	0	0	1	1
Maryland [2]	0	0	69	27	0	0	16	6
District of Columbia	0		23		0		5	
Virginia								
West Virginia	0	1	46	71	6	23	7	18
North Carolina	0		46		76		3	
South Carolina	1	1	27	14	9	3	13	9
Georgia	1	0	19	16	52	0	7	10
Florida	2	0	14	10	30	0	16	8

[2] Week ended Friday.
[3] Exclusive of Tulsa.
[4] Exclusive of Kansas City.
[5] Exclusive of New Orleans.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 1, 1927, and December 31, 1927—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927	Week ended Jan. 1, 1927	Week ended Dec. 31, 1927
East South Central States:								
Kentucky	-------	0	-------	107	-------	83	-------	32
Tennessee	0	1	40	23	0	14	16	6
Alabama	0	0	15	35	12	5	21	10
Mississippi	1	1	19	15	11	1	1	6
West South Central States:								
Arkansas	0	1	10	9	0	3	7	4
Louisiana	1	[5] 0	16	[5] 5	4	[5] 4	12	[5] 2
Oklahoma [3]	2	1	36	53	18	56	15	18
Texas	0	-------	53	-------	60	-------	28	-------
Mountain States:								
Montana	0	0	51	27	10	8	-------	1
Idaho	0	0	32	7	1	2	1	0
Wyoming	0	0	39	27	0	1	0	6
Colorado	0	0	65	32	39	12	1	0
New Mexico	0	1	28	14	0	0	5	3
Arizona	0	1	-------	11	0	2	0	10
Utah [1]	0	0	1	6	4	53	0	0
Nevada	-------	-------	-------	-------	-------	-------	-------	-------
Pacific States:								
Washington	0	4	66	26	45	36	3	2
Oregon	0	10	58	23	29	46	2	5
California	0	8	173	137	6	11	7	7

[1] Week ended Friday. [3] Exclusive of Tulsa. [5] Exclusive of New Orleans.

Reports for Week Ended December 24, 1927

DIPTHERIA

	Cases
District of Columbia	12

INFLUENZA

District of Columbia	1

MEASLES

	Cases
District of Columbia	2
New Hampshire	6

SCARLET FEVER

District of Columbia	27
New Hampshire	2

Reports for Week Ended December 17, 1927

DISTRICT OF COLUMBIA

	Cases
Diphtheria	13
Measles	1
Scarlet fever	36
Typhoid fever	2

NEW HAMPSHIRE

Diphtheria	2
Measles	7
Scarlet fever	7

NORTH DAKOTA

	Cases
Diphtheria	3
Measles	4
Meningococcus miningitis	2
Poliomyelitis	1
Scarlet fever	27
Smallpox	2

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October, 1927										
Hawaii Territory	1	24	7		14		1			19
November, 1927										
Idaho	6	15			12		23	105	36	2
Illinois	28	787	65	6	120	6	52	990	120	122
Louisiana	4	252	46	146	85	47	2	80	30	60
Maine	0	14	15		190	1	21	189	0	18
Michigan	0	493	6	1	530		37	814	71	62
Mississippi	2	351	2,841	5,622	1,593	638	8	184	17	68
Missouri	8	372	47	197	65	1	36	390	308	86
Oklahoma [1]	2	392	171	268	124	16	12	147	94	146
Oregon	3	80	57		69		110	87	135	32
South Carolina	0	599	1,946	1,718	758	187	10	155	37	128
Washington	15	179	19		633		76	210	104	25
Wisconsin	25	149	107		322		24	480	99	15

[1] Exclusive of Oklahoma City and Tulsa.

	Cases
October, 1927	
Hawaii Territory:	
Chicken pox	6
Conjunctivitis (follicular)	28
Dysentery (amoebic)	2
Leprosy	1
Tetanus	4
Trachoma	3
Whooping cough	3
November, 1927	
Anthrax:	
Oregon	1
Chicken pox:	
Idaho	104
Illinois	1,402
Louisiana	56
Maine	154
Michigan	659
Mississippi	615
Missouri	263
Oklahoma [1]	157
Oregon	133
South Carolina	118
Washington	435
Wisconsin	898
Conjunctivitis:	
Idaho	50
Dengue:	
Mississippi	12
South Carolina	22
Dysentery:	
Illinois	20
Louisiana	5
Mississippi (amoebic)	39
Mississippi (bacillary)	459
Oklahoma [1]	9
Washington	1
German measles:	
Illinois	25
Maine	6
Washington	45
Wisconsin	10

[1] Exclusive of Oklahoma City and Tulsa.

	Cases
Hookworm disease:	
Louisiana	6
Mississippi	236
South Carolina	117
Impetigo contagiosa:	
Oregon	8
Washington	12
Lead poisoning:	
Illinois	15
Lethargic encephalitis:	
Illinois	9
Louisiana	1
Michigan	2
Missouri	1
Oregon	1
Washington	5
Wisconsin	3
Leprosy:	
Michigan	1
Washington	1
Mumps:	
Idaho	97
Illinois	523
Louisiana	22
Maine	70
Michigan	548
Mississippi	448
Missouri	158
Oklahoma [1]	15
Oregon	30
Washington	274
Wisconsin	237
Ophthalmia neonatorum:	
Illinois	36
Louisiana	1
Mississippi	11
Missouri	2
South Carolina	19
Paratyphoid fever:	
Illinois	2
Maine	1
South Carolina	11
Washington	2

	Cases
Puerperal fever:	
Illinois	5
Mississippi	34
Washington	2
Rabies in animals:	
Mississippi	6
Missouri	2
Oregon	2
South Carolina	18
Rabies in man:	
Illinois	2
Ringworm:	
Washington	3
Scabies:	
Oregon	23
Washington	10
Septic sore throat:	
Illinois	4
Louisiana	1
Maine	1
Michigan	12
Missouri	2
Oklahoma [1]	14
Oregon	6
Tetanus:	
Illinois	3
Louisiana	2
Missouri	2
Washington	1

[1] Exclusive of Oklahoma City and Tulsa.

	Cases
Trachoma:	
Illinois	12
Louisiana	1
Mississippi	13
Missouri	7
Oklahoma [1]	16
Tularemia:	
Illinois	1
Louisiana	1
Vincents angina:	
Idaho	1
Illinois	1
Maine	9
Oklahoma [1]	1
Washington	6
Whooping cough:	
Idaho	9
Illinois	731
Louisiana	38
Maine	48
Michigan	408
Mississippi	1,030
Missouri	159
Oklahoma [1]	23
Oregon	17
South Carolina	301
Washington	38
Wisconsin	254

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 99 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,600,000. The estimated population of the 93 cities reporting deaths is more than 29,950,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended December 17, 1927, and December 18, 1926

	1927	1926	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	2,277	2,056	
99 cities	1,212	1,091	1,210
Measles:			
41 States	4,817	6,006	
99 cities	1,437	1,129	
Poliomyelitis:			
43 States	114	20	
Scarlet fever:			
43 States	3,616	4,185	
99 cities	1,245	1,614	1,131
Smallpox:			
43 States	799	682	
99 cities	112	92	62
Typhoid fever:			
43 States	339	372	
99 cities	45	68	59
Deaths reported			
Influenza and pneumonia:			
93 cities	763	858	
Smallpox:			
93 cities	0	1	
Charleston, W. Va	0	1	

City reports for week ended December 17, 1927

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1918 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	75,333	9	2	2	0	0	0	2	1
New Hampshire:									
Concord	22,546	0	0	0	0	0	3	0	1
Vermont:									
Barre	10,008	4	0	0	0	0	0	0	0
Burlington	24,089	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	779,620	77	56	18	3	2	219	2	21
Fall River	128,993	4	5	1	0	0	2	0	2
Springfield	142,065	7	5	6	1	0	0	9	1
Worcester	190,757	13	4	7	1	0	1	14	3
Rhode Island:									
Pawtucket	69,760	0	2	6	0	0	0	0	1
Providence	267,918	7	10	18	1	0	3	4	1
Connecticut:									
Bridgeport	(1)	3	9	11	1	3	0	0	6
Hartford	160,197	5	8	11	0	0	0	0	0
New Haven	178,927	8	4	6	0	0	32	10	7
MIDDLE ATLANTIC									
New York:									
Buffalo	538,016	58	25	31	2	2	84	38	11
New York	5,873,356	146	190	269	12		64	20	139
Rochester	316,786	5	11	15	0	0	6	3	2
Syracuse	182,003	25	7	0	0	0	33	9	5
New Jersey:									
Camden	128,642	9	6	5	0	0	1	0	2
Newark	452,513	26	14	27	1	0	20	8	9
Trenton	132,020	0	7	3	0	2	8	1	1
Pennsylvania:									
Philadelphia	1,979,364	124	84	52	-------	6	9	62	46
Pittsburgh	631,563	40	23	49	-------	3	192	48	20
Reading	112,707	10	4	6	-------	0	0	5	3
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	409,333	13	17	28	0	2	40	2	12
Cleveland	936,485	59	47	97	2	0	23	98	11
Columbus	279,836	3	9	5	2	2	2	2	9
Toledo	287,380	73	15	15	2	2	60	27	6
Indiana:									
Fort Wayne	97,846	0	6	8	0	0	0	0	2
Indianapolis	358,819	15	13	7	0	1	1	22	8
South Bend	80,091	2	2	0	0	0	0	0	2
Terre Haute	71,071	2	2	3	0	0	0	0	1
Illinois:									
Chicago	2,995,239	112	113	135	11	6	10	38	64
Springfield	63,923	1	3	2	1	1	0	10	1
Michigan:									
Detroit	1,245,824	63	77	62	6	3	74	26	18
Flint	130,316	8	11	3	0	0	1	54	3
Grand Rapids	153,698	5	5	0	0	1	19	8	2

[1] No estimate made.

City reports for week ended December 17, 1927—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha	50,891	22	1	1	0	0	2	6	1
Madison	46,385	9	2	0	0	0	0	1	1
Milwaukee	509,192	70	29	19	2	1	4	14	8
Racine	67,707	12	4	0	0	0	0	2	2
Superior	39,671	7	0	1	0	0	0	0	2
WEST NORTH CENTRAL									
Minnesota:									
Duluth	110,502	3	2	0	0	0	0	1	2
Minneapolis	425,435	84	25	11	0	1	0	8	13
St. Paul	246,001	21	19	3	0	0	2	38	9
Iowa:									
Davenport	52,469	2	1	0	0	-------	0	0	-------
Des Moines	141,441	0	6	1	0	0	0	0	2
Sioux City	76,411	4	3	0	0	-------	2	4	-------
Waterloo	36,771	15	1	0	0	-------	1	0	-------
Missouri:									
Kansas City	367,481	35	13	5	0	1	2	94	6
St. Joseph	78,342	5	3	0	0	0	0	0	3
St. Louis	821,543	9	51	35	0	0	14	10	-------
North Dakota:									
Fargo	26,403	26	0	0	0	0	0	1	0
Grand Forks	11,811	5	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	15,036	2	0	0	0	-------	0	0	-------
Sioux Falls	30,127	0	1	0	0	-------	1	0	-------
Nebraska:									
Lincoln	60,941	17	1	2	0	0	0	18	0
Omaha	211,768	17	5	4	0	0	0	0	5
Kansas:									
Topeka	55,411	14	2	4	1	1	2	0	2
Wichita	88,367	10	7	3	0	0	0	0	4
SOUTH ATLANTIC									
Delaware:									
Wilmington	122,049	3	2	3	0	0	0	0	2
Maryland:									
Baltimore	796,296	131	38	18	14	0	56	10	31
Cumberland	33,741	0	1	0	0	0	0	0	1
Frederick	12,035	1	0	0	0	0	0	0	0
District of Columbia:									
Washington	497,906	23	21	13	0	0	1	0	10
Virginia:									
Lynchburg	30,395	2	2	11	0	0	0	0	2
Norfolk	[1]	30	4	2	0	0	9	6	5
Richmond	186,403	1	11	4	0	1	34	0	3
Roanoke	58,208	1	3	1	0	0	2	2	1
West Virginia:									
Charleston	49,019	0	2	0	0	0	0	0	0
Wheeling	56,208	13	2	3	0	0	1	0	0
North Carolina:									
Raleigh	30,371	13	3	2	0	0	0	0	2
Wilmington	37,061	5	1	1	0	0	152	0	3
Winston-Salem	69,031	4	2	1	0	1	3	19	5
South Carolina:									
Charleston	73,125	2	2	0	17	0	0	0	6
Columbia	41,225	7	1	4	0	0	25	17	2
Greenville	27,311	2	0	0	0	0	28	5	1
Georgia:									
Atlanta	[1]	1	5	5	31	4	0	4	8
Brunswick	16,809	0	0	0	0	0	0	1	1
Savannah	93,134	0	2	4	5	2	22	1	5
Florida:									
Miami	69,754	3	-------	2	3	0	0	0	0
St. Petersburg	26,847	-------	1	-------	-------	0	-------	-------	0
Tampa	94,743	9	2	5	8	0	2	2	1

[1] No estimate made.

City reports for week ended December 17, 1927—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,309	0	2	1	0	0	0	0	3
Lexington	46,895	0	1	0	0	0	0	0	1
Louisville	305,935	-------	9	-------	-------	-------	-------	-------	-------
Tennessee:									
Memphis	174,533	4	7	11	0	3	95	4	7
Nashville	136,220	5	4	2	0	3	3	14	5
Alabama:									
Birmingham	205,670	9	6	5	16	5	2	1	7
Mobile	65,955	0	2	0	0	1	0	0	0
Montgomery	46,481	1	1	3	1	0	0	2	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	31,643	0	2	1	0	-------	0	0	-------
Little Rock	74,216	0	1	0	0	0	21	0	0
Louisiana:									
New Orleans	414,493	1	11	8	11	10	0	0	18
Shreveport	57,857	4	2	1	0	0	25	1	4
Oklahoma:									
Oklahoma City	(1)	1	3	11	0	0	0	1	4
Tulsa	124,478	7	5	7	0	0	0	2	0
Texas:									
Dallas	194,450	3	14	22	0	1	1	0	1
Galveston	48,375	0	1	2	0	0	0	0	3
Houston	164,954	0	5	10	0	1	0	1	8
San Antonio	198,069	0	4	8	0	1	13	0	11
MOUNTAIN									
Montana:									
Billings	17,971	1	0	0	0	0	0	0	0
Great Falls	29,883	2	1	0	0	0	1	0	3
Helena	12,037	0	0	0	0	0	0	0	2
Missoula	12,668	5	0	0	0	0	0	0	0
Idaho:									
Boise	23,042	1	0	0	0	0	0	3	0
Colorado:									
Denver	280,911	29	13	10	-------	0	2	19	6
Pueblo	43,787	28	4	1	0		0	0	1
New Mexico:									
Albuquerque	21,000	0	1	1	0	0	6	0	0
Utah:									
Salt Lake City	130,948	22	4	7	0	0	0	0	3
Nevada:									
Reno	12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(1)	14	7	0	0	-------	71	15	-------
Spokane	108,897	22	4	1	0	-------	0	0	-------
Tacoma	104,455	1	3	0	0	0	1	0	2
Oregon:									
Portland	282,383	21	11	6	5	0	7	9	7
California:									
Los Angeles	(1)	18	41	44	15	3	7	17	28
Sacramento	72,260	2	3	2	0	0	3	1	2
San Francisco	557,530	63	19	17	0	2	9	20	6

[1] No estimate made.

City reports for week ended December 17, 1927—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	2	0	0	0	0	1	1	0	0	1	23
New Hampshire:											
Concord	1	0	0	0	0	0	0	0	0	0	8
Vermont:											
Barre	1	1	0	0	0	0	0	0	0	0	1
Burlington	1	2	0	0	0	0	0	0	0	0	5
Massachusetts:											
Boston	53	81	0	0	0	17	1	0	0	68	217
Fall River	2	6	0	0	0	2	0	0	0	2	32
Springfield	7	8	0	0	0	2	0	0	0	4	30
Worcester	12	4	0	0	0	1	0	0	0	1	48
Rhode Island:											
Pawtucket	1	3	0	0	0	0	0	0	0	0	16
Providence	7	25	0	0	0	0	1	0	0	1	46
Connecticut:											
Bridgeport	9	6	0	0	0	3	0	0	0	1	38
Hartford	7	5	0	0	0	1	0	0	0	5	37
New Haven	8	1	0	0	0	3	1	0	0	19	37
MIDDLE ATLANTIC											
New York:											
Buffalo	23	23	0	0	0	7	1	0	0	25	140
New York	173	208	1	0	0	86	13	14	0	184	1,352
Rochester	11	6	0	0	0	1	1	1	0	4	62
Syracuse	12	13	0	0	0	[illegible]	0	0	0	10	48
New Jersey:											
Camden	5	4	0	0	0	1	0	0	0	0	34
Newark	19	18	0	0	0	2	1	0	0	55	93
Trenton	3	2	0	0	0	4	0	0	0	0	42
Pennsylvania:											
Philadelphia	72	87	1	0	0	25	4	0	1	43	492
Pittsburgh	33	33	0	0	0	9	1	1	0	6	191
Reading	2	9	0	0	0	2	0	0	0	4	31
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	14	16	0	0	0	11	0	0	0	4	150
Cleveland	34	47	0	1	0	7	1	2	0	32	189
Columbus	11	28	1	1	0	2	1	0	0	3	64
Toledo	13	16	0	0	0	9	1	1	0	17	76
Indiana:											
Fort Wayne	3	3	1	0	0	1	0	0	0	0	36
Indianapolis	11	7	5	9	0	4	0	0	0	4	86
South Bend	4	2	0	0	0	1	0	0	0	0	9
Terre Haute	3	2	1	3	0	0	0	0	0	0	28
Illinois:											
Chicago	113	110	2	8	0	39	4	0	2	94	679
Springfield	2	6	0	0	0	1	0	0	0	1	21
Michigan:											
Detroit	88	61	2	1	0	22	2	2	0	57	249
Flint	8	24	1	0	0	1	0	0	0	6	27
Grand Rapids	10	7	0	0	0	0	0	1	0	0	29
Wisconsin:											
Kenosha	1	1	1	1	0	1	0	0	0	1	6
Madison	3	5	0	0	0	1	0	0	0	0	6
Milwaukee	20	37	2	1	0	8	0	0	1	13	136
Racine	5	9	0	0	0	1	0	0	0	7	11
Superior	2	4	0	0	0	0	0	0	0	0	9
WEST NORTH CENTRAL											
Minnesota:											
Duluth	9	3	0	0	0	1	0	0	0	2	16
Minneapolis	50	26	6	0	0	2	1	0	0	2	123
St. Paul	25	7	3	3	0	3	1	1	1	0	58
Iowa:											
Davenport	1	2	1	1	--------	--------	0	0	--------	2	--------
Des Moines	6	21	0	13	0	3	0	0	0	0	35
Sioux City	2	5	1	1	--------	--------	0	0	--------	2	--------
Waterloo	3	1	0	0	--------	--------	0	0	--------	0	--------

City reports for week ended December 17, 1927—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL—contd.											
Missouri:											
Kansas City	12	11	1	4	0	4	0	1	0	4	94
St. Joseph	2	3	0	28	0	1	0	0	0	0	29
St. Louis	37	27	0	0	0	7	2	1	0	10	218
North Dakota:											
Fargo	2	3	0	0	0	0	0	0	0	0	4
Grand Forks	0	0	0	0			0	0		0	
South Dakota:											
Aberdeen	1	2	1	0			0	0		0	
Sioux Falls	1	3	0	0			0	0		0	9
Nebraska:											
Lincoln	2	6	0	1	0	0	0	0	0	4	8
Omaha	7	4	3	2	0	0	1	0	1	0	70
Kansas:											
Topeka	2	1	1	0	0	2	0	0	0	2	14
Wichita	4	12	1	20	0	1	0	0	0	0	35
SOUTH ATLANTIC											
Delaware:											
Wilmington	4	3	0	0	0	2	1	0	0	5	27
Maryland:											
Baltimore	26	13	0	0	0	14	3	1	0	25	207
Cumberland	1	1	0	0	0	0	0	0	0	0	16
Frederick	1	0	0	0	0	0	0	0	0	0	3
District of Columbia:											
Washington	19	36	0	0	0	8	2	2	0	10	114
Virginia:											
Lynchburg	1	2	0	0	0	0	0	0	0	0	12
Norfolk	2	2	0	0	0	2	0	0	0	1	
Richmond	6	8	0	0	0	3	0	0	0	0	54
Roanoke	2	4	1	0	0	0	0	0	0	2	10
West Virginia:											
Charleston	2	2	0	0	0	0	0	0	0	0	3
Wheeling	2	1	0	0	0	0	1	1	0	0	14
North Carolina:											
Raleigh	1	2	0	0	0	0	0	0	0	0	8
Wilmington	1	2	1	0	0	1	0	[illegible]	0	0	11
Winston-Salem	1	4	1	0	0	1	0	0	0	0	19
South Carolina:											
Charleston	1	0	0	1	0	0	1	0	0	1	32
Columbia	0	0	0	0	0	0	0	0	0	0	10
Greenville	0	2	1	0	0	2	1	0	0	0	6
Georgia:											
Atlanta	4	3	2	0	0	4	1	1	1	0	86
Brunswick	0	0	0	0	0	0	0	0	0	0	2
Savannah	0	1	0	2	0	2	1	0	0	0	35
Florida:											
Miami		4		0	0	3		0	0	0	25
St. Petersburg	0		0		0	2	0		0		22
Tampa	1	4	0	0	0	3	0	0	0	0	28
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	2	0	0	0	0	0	0	0	0	11
Lexington	1	0	0	0	0	2	0	0	0	0	15
Louisville	5		1				1				
Tennessee:											
Memphis	5	9	0	0	0	5	0	0	0	0	65
Nashville	3	3	1	1	0	3	0	1	0	0	51
Alabama:											
Birmingham	4	4	0	0	0	5	1	3	0	0	[illegible]
Mobile	0	0	0	0	0	0	0	0	0	0	17
Montgomery	1	2	0	0	0	0	0	0	0	0	

City reports for week ended December 17, 1927—**Continued**

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	2	0	0	--------	--------	0	1	--------	2	--------
Little Rock	2	1	0	0	0	3	1	0	0	0	--------
Louisiana:											
New Orleans	7	8	1	0	0	11	2	2	2	2	179
Shreveport	0	4	0	0	0	0	1	1	0	0	27
Oklahoma:											
Oklahoma City	3	5	0	11	0	0	0	0	0	0	21
Tulsa	2	3	0	0	0	0	0	0	0	0	--------
Texas:											
Dallas	3	14	0	0	0	4	0	0	0	0	50
Galveston	0	1	0	0	0	1	0	0	0	0	21
Houston	2	7	1	0	0	0	0	0	1	0	45
San Antonio	1	4	0	0	0	6	0	0	0	0	61
MOUNTAIN											
Montana:											
Billings	1	0	0	5	0	0	0	0	0	1	8
Great Falls	2	4	1	2	0	0	0	1	0	0	8
Helena	0	0	0	0	0	1	0	0	0	0	7
Missoula	0	0	0	0	0	0	0	0	0	0	3
Idaho:											
Boise	1	1	0	0	0	0	0	0	0	0	11
Colorado:											
Denver	12	15	1	0	0	14	1	1	0	2	101
Pueblo	2	1	0	0	0	0	0	0	0	0	16
New Mexico:											
Albuquerque	1	1	0	0	0	5	0	0	0	0	8
Utah:											
Salt Lake City	2	6	1	6	0	5	1	0	0	2	42
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	6
PACIFIC											
Washington:											
Seattle	8	7	2	0	--------	--------	1	3	--------	2	--------
Spokane	6	11	5	10	--------	--------	0	0	--------	0	--------
Tacoma	4	8	5	0	0	1	0	1	0	0	34
Oregon:											
Portland	7	7	6	13	0	0	0	0	1	1	--------
California:											
Los Angeles	26	11	4	1	0	29	2	1	0	17	258
Sacramento	2	2	0	0	0	2	0	1	0	0	27
San Francisco	12	20	1	1	0	7	1	0	0	0	140

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	0	0	0	0	0	1	5	1
Rhode Island:									
Providence	0	0	0	0	0	0	0	1	1
MIDDLE ATLANTIC									
New York:									
New York	2	0	4	2	0	0	1	2	2
Pennsylvania:									
Philadelphia	2	1	0	0	0	0	0	0	0
Pittsburgh	0	1	1	0	0	0	0	0	0

City reports for week ended December 17, 1927—Continued.

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cleveland	1	0	0	0	0	0	1	0	0
Indiana:									
Indianapolis	1	1	0	0	0	0	0	1	0
Illinois:									
Chicago	6	2	0	0	0	0	0	0	0
Michigan:									
Detroit	0	1	0	0	0	0	1	0	0
Wisconsin:									
Milwaukee	2	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	1	0	0	0	0	0	0	0
St. Paul	0	0	0	0	0	0	0	0	1
Iowa:									
Des Moines	0	0	0	0	0	0	0	1	0
Missouri:									
Kansas City	0	0	0	0	0	0	0	1	1
St. Louis [1]	2	0	0	0	0	0	0	0	0
Kansas:									
Topeka	0	0	0	0	0	0	0	1	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	1	0	0	0	0	0	2	0
South Carolina:									
Charleston [2]	1	0	0	0	1	1	0	0	0
Georgia:									
Savannah [1]	0	0	0	0	1	0	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Birmingham	0	0	0	0	2	2	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	1	1	0	0	1	0	0	0	0
Shreveport	0	0	0	0	0	1	0	1	0
Texas:									
Dallas	0	0	0	0	1	1	0	0	0
MOUNTAIN									
Colorado:									
Denver	1	0	0	1	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	0		0		0		0	2	
Spokane	1		0		0		0	1	
Oregon:									
Portland	1	0	1	0	0	0	0	1	0
California:									
Los Angeles	1	0	0	0	0	0	0	2	1
Sacramento	0	0	0	0	0	0	0	2	0
San Francisco	0	0	0	0	1	0	0	0	0

[1] Typhus fever: St. Louis, Mo., 2 cases; Savannah, Ga., 1 case.
[2] Dengue: Charleston, S. C., 1 case.

Summary of weekly reports from cities, November 13 to December 17, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Nov. 20, 1926	Nov. 19, 1927	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927
101 cities	230	228	212	[2] 204	224	[3] 233	201	[4] 205	188	[5] 200
New England	139	163	132	169	172	267	163	216	160	200
Middle Atlantic	159	234	155	213	177	252	161	228	167	220
East North Central	292	251	258	220	266	220	223	228	213	248
West North Central	214	153	192	179	210	179	194	[6] 130	129	129
South Atlantic	276	217	281	[2] 197	240	230	237	190	216	[7] 141
East South Central	367	239	217	122	300	168	284	71	145	[8] 162
West South Central	326	348	301	306	318	273	266	218	258	218
Mountain	146	207	201	171	228	144	246	144	164	162
Pacific	324	223	303	162	268	259	238	[9] 162	252	168

MEASLES CASE RATES

	Nov. 20, 1926	Nov. 19, 1927	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927
101 cities	135	125	134	[2] 137	177	[3] 190	197	[4] 221	193	[5] 251
New England	47	390	57	499	101	539	165	539	229	604
Middle Atlantic	28	93	30	129	37	180	23	199	24	206
East North Central	120	54	135	60	151	122	212	140	256	117
West North Central	198	22	109	21	113	24	129	[6] 50	109	46
South Atlantic	54	283	22	[2] 202	48	[3] 326	54	527	89	[7] 562
East South Central	31	148	16	163	26	224	78	367	21	[8] 737
West South Central	26	71	103	88	112	122	146	134	82	252
Mountain	1,950	72	2,543	27	2,844	27	3,217	36	2,351	27
Pacific	488	212	338	175	699	228	613	[9] 72	603	238

SCARLET FEVER CASE RATES

	Nov. 20, 1926	Nov. 19, 1927	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927
101 cities	212	177	213	[2] 159	242	[4] 185	238	[4] 183	279	[5] 212
New England	330	248	285	181	325	276	340	320	387	325
Middle Atlantic	130	152	138	122	157	155	178	156	214	199
East North Central	201	202	196	196	237	192	235	216	241	243
West North Central	407	232	411	204	436	250	432	[6] 197	413	204
South Atlantic	143	156	156	[2] 173	181	[3] 176	173	131	199	[7] 161
East South Central	228	112	238	87	243	148	150	82	248	[8] 147
West South Central	116	105	198	168	210	143	142	117	236	172
Mountain	638	234	784	180	930	360	802	306	1,112	243
Pacific	335	154	240	131	265	128	230	[9] 138	383	154

SMALLPOX CASE RATES

	Nov. 20, 1926	Nov. 19, 1927	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927
101 cities	5	19	5	[2] 22	14	[3] 17	11	[4] 11	16	[5] 19
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	1	0	1	0
East North Central	3	6	7	1	21	10	7	4	11	17
West North Central	4	161	30	202	48	115	38	[6] 76	46	115
South Atlantic	4	9	4	[2] 2	19	[3] 6	19	7	26	[7] 5
East South Central	0	5	5	0	0	10	21	5	78	[8] 7
West South Central	4	4	4	4	9	8	9	8	43	0
Mountain	0	27	0	54	18	45	18	99	0	117
Pacific	48	29	5	45	35	39	43	[9] 7	40	31

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1926 and 1927, respectively.

[2] Frederick, Md., not included.

Norfolk, Va., not included.

Fargo, N. Dak., Seattle and Spokane, Wash., not included.

Greenville, S. C., and Louisville, Ky., not included.

Fargo, N. Dak., not included.

Greenville, S. C., not included.

Louisville, Ky., not included.

Seattle and Spokane, Wash., not included.

Summary of weekly reports from cities, November 13 to December 17, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926 [1]—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Nov. 20, 1926	Nov. 19, 1927	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927
101 cities	16	15	12	[2] 10	10	[3] 9	13	[4] 11	12	[5] 8
New England	7	23	7	14	7	7	2	12	31	0
Middle Atlantic	21	14	13	10	9	10	18	8	8	8
East North Central	5	7	3	6	6	5	3	9	5	3
West North Central	6	20	8	14	10	12	4	[6] 14	10	6
South Atlantic	22	25	19	[2] 9	17	[3] 17	24	9	19	[7] 9
East South Central	36	15	31	15	41	15	41	31	21	[8] 29
West South Central	13	29	17	13	9	21	13	21	21	17
Mountain	27	18	18	27	9	9	9	9	9	18
Pacific	29	13	21	5	16	5	16	[9] 10	24	16

INFLUENZA DEATH RATES

	Nov. 20, 1926	Nov. 19, 1927	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927
95 cities	10	9	10	[10] 11	14	[3] 12	17	[6] 12	14	[5] 14
New England	2	5	9	2	7	5	9	9	7	12
Middle Atlantic	10	7	7	10	13	11	12	7	13	9
East North Central	10	2	9	5	9	9	14	9	12	11
West North Central	6	17	2	6	4	4	15	[6] 6	15	6
South Atlantic	8	20	15	[2] 13	21	[3] 14	34	17	26	[7] 15
East South Central	31	20	41	46	41	46	41	56	5	[8] 88
West South Central	31	34	31	34	40	43	40	47	40	56
Mountain	9	36	36	18	46	27	36	9	9	9
Pacific	4	3	0	[11] 14	11	14	11	3	7	17

PNEUMONIA DEATH RATES

	Nov. 20, 1926	Nov. 19, 1927	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927
95 cities	123	112	126	[10] 97	123	[3] 111	129	[6] 110	137	[5] 118
New England	104	102	132	60	118	100	134	51	149	102
Middle Atlantic	136	119	138	98	151	123	140	119	147	117
East North Central	104	96	98	89	89	103	103	97	117	97
West North Central	120	81	74	87	71	71	118	[6] 101	120	91
South Atlantic	144	160	166	[2] 148	106	[3] 153	55	138	127	[7] 163
East South Central	171	148	103	127	131	199	171	148	129	[8] 162
West South Central	151	142	207	112	163	108	150	103	172	104
Mountain	109	99	146	99	210	54	109	216	273	135
Pacific	74	76	124	[11] 76	152	103	113	110	124	131

[2] Frederick, Md., not included.
[3] Norfolk, Va., not included.
[4] Fargo, N. Dak., and Seattle and Spokane, Wash., not included.
[5] Greenville, S. C., and Louisville, Ky., not included.
[6] Fargo, N. Dak., not included.
[7] Greenville, S. C., not included.
[8] Louisville, Ky., not included.
[9] Seattle and Spokane, Wash., not included.
[10] Frederick, Md., and Los Angeles, Calif., not included.
[11] Los Angeles, Calif., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1926 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1926	1927	1926	1927
Total	101	95	30, 443, 800	30, 966, 700	29, 783, 700	30, 295, 900
New England	12	12	2, 211, 000	2, 245, 900	2, 211, 000	2, 245, 900
Middle Atlantic	10	10	10, 457, 000	10, 567, 000	10, 457, 000	10, 567, 000
East North Central	16	16	7, 650, 200	7, 810, 600	7, 650, 200	7, 810, 600
West North Central	12	10	2, 585, 500	2, 626, 600	2, 470, 600	2, 510, 000
South Atlantic	21	20	2, 799, 500	2, 878, 100	2, 757, 700	2, 835, 700
East South Central	7	7	1, 008, 300	1, 023, 500	1, 008, 300	1, 023, 500
West South Central	8	7	1, 213, 800	1, 243, 300	1, 181, 500	1, 210, 400
Mountain	9	9	572, 100	580, 000	572, 100	580, 000
Pacific	6	4	1, 946, 400	1, 991, 700	1, 475, 300	1, 512, 800

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended December 3, 1927.—The following report for the week ended December 3, 1927, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

Egypt.—Alexandria.
India.—Rangoon.
Dutch East Indies.—Makassar, Cheribon.

CHOLERA

India.—Calcutta, Rangoon.
Straits Settlements.—Singapore.
Dutch East Indies.—Batavia.
Siam.—Bangkok
China.—Canton.

SMALLPOX

Aden Protectorate.—Aden.
Iraq.—Basra.
India.—Bombay, Cochin, Calcutta, Madras, Rangoon.
Dutch East Indies.—Surabaya.
Siam.—Bangkok.
Kwantung.—Dairen.
Manchuria.—Mukden, Changchun.
Japan.—Osaka.

Returns for the week ended December 3 were not received from Banjermasin, Dutch East Indies, or Vladivostok, Union of Socialist Soviet Republics.

CANADA

Communicable diseases—Quebec—Week ended December 17, 1927.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended December 17, 1927, as follows:

Disease	Cases	Disease	Cases
Chicken pox	64	Scarlet fever	97
Diphtheria	98	Smallpox	12
German measles	4	Tuberculosis	24
Influenza	5	Typhoid fever	18
Measles	129	Whooping cough	13

ECUADOR

Plague—Plague rats—Guayaquil—November, 1927.—During the month of November, 1927, nine cases of plague with three deaths were reported at Guayaquil, Ecuador.

During the same period, of 23,240 rats trapped, six rats were found plague infected.

EGYPT

Further relative to plague—Alexandria—November 25–December 1, 1927.—On November 25 and 26, 1927, two additional cases of plague, both bubonic, were reported at Alexandria, occurring in the group of Barbary workmen in which the two previously reported cases occurred,[1] November 22 and 23, 1927. On December 1, two cases were reported in a group related to that in which the two previously reported cases occurred. Both of these last-named cases were found dead in their houses. The houses were stated to be situated about 1 kilometer from the port.

ESTONIA

Communicable diseases—October, 1927.—During the month of October, 1927, communicable diseases were reported in the Republic of Estonia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Scarlet fever	237
Diphtheria	37	Tuberculosis	125
Measles	19	Typhoid fever	72

Population, 1,107,059

IRISH FREE STATE (IRELAND)

Typhus fever—County Cork—December 4–10, 1927.—During the week ended December 10, 1927, three cases of typhus fever were reported in the urban district of Cork County Borough.

JAPAN

Dysentery—Tokyo, city and prefecture—October 2–29, 1927.—During the period October 2 to 29, 1927, 190 cases of dysentery with 123 deaths were reported in the city of Tokyo, Japan, and 246 cases with 116 deaths in the prefecture of Tokyo, outside of the city.

LATVIA

Communicable diseases—October, 1927.—During the month of October, 1927, communicable diseases were reported in Latvia as follows:

Disease	Cases	Disease	Cases
Diphtheria	29	Puerperal fever	4
Dysentery	2	Scarlet fever	158
Erysipelas	11	Smallpox	2
Influenza	37	Tetanus	1
Leprosy	1	Trachoma	12
Measles	58	Typhoid fever	101
Mumps	3	Whooping cough	34
Poliomyelitis	2		

Population, estimated: 1,950,000.

[1] Public Health Reports, Dec. 30, 1927, p. 3218.

PERU

Mortality from communicable diseases—All causes—Arequipa—October, 1927.—During the month of October, 1927, mortality from contagious diseases, and deaths from all causes were reported at Arequipa, Peru, as follows:

Disease	Deaths	Disease	Deaths
Gastroenteritis	12	Tuberculosis	18
Influenza	9	Typhoid fever	1
Measles	4	Typhus fever	2
Scarlet fever	1	Whooping cough	11

Population, estimated, 43,000. Mortality, all causes, 102.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Week ended—														
		September, 1927				October, 1927					November, 1927				December, 1927	
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10
China	C	32														
Amoy	C	18	21	19	14	10	4	2								
	D	1	2													
Canton	C	10	17	7	2	6		2	6	5	1	6				
	D	6	10	7	2	6		2	6	5	1	5				
Foochow	C	P		P	P	P	P	P	P							
Hong Kong	C	1	P	P	P	P	P	P								
	D	1														
Shanghai	C	1	3	2		1	2									
	D	25	22	21	6	4		2	1							
Swatow	C	P	P		P		P	P	P	P	P					
Tientsin	C	4	3	5	3	2										
India	C	11,180	8,391	6,630	5,189	4,907	4,055	6,142	5,056	5,303						
	D	5,559	4,278	3,532	2,526	2,549	2,104	3,027	2,691	2,867						
Bombay	C	1	1	1								2				
	D	1	1									2				
Calcutta	C	18	19	20	19	21	13	34	33	28	35	65				
	D	10	13	5	11	15	11	19	19	22	25	42	49	106	77	55
Madras	C	29	8	15	7	4	9		1			3	4			
	D	24	11	6	7	3	3	1	1			3	4			
Rangoon	C				2	3	1		2		1					
	D				2	3	1		1	1						
India, French Settlements in	C	6	4	1												
	D	3	4	1												
Karikal	C	1														
	D	1														
Pondicherry	C	4	4	1	6											
	D	2	2	1	8											

Place																
Indo-China:																
Cochin-China—																
Saigon	C						1									
Iraq[1]																
Amarah	C								35	4	8	3				
	D								23	6	8	3				
Baghdad	C								1		10	13				
	D								1		5	2				
Basra	C		21						1							
Diwaniyah	C								28	4	3	1				
	D								17	2						
Hillah	C								12	7	3	5				
	D								7	6	2	1				
Kerbala	C								3	1	4	2				
	D								3	1	5	2				
Kut	C								11	9	1	5				
	D								8	4	1	3				
Muntafique	C								4			4				
	D								1			2				
Ramadi	C									19	18	27				
	D									10	23	14				
Java:																
Batavia	C										1		25			
	D										1		15			
Siam	C	4	5	21		6	4	8	8	14	23					
	D	3	3	11		4	2	5	7	10	15					
Bangkok	C	1	1	1			2	3	1		1		3		1	1
	D			1				3	1		1		1		1	
On vessel S. S. Tabaristan; at Basra	C						1									

Place		September, 1927			October, 1927		November, 1927	
		1-10	11-20	21-30	11-20	21-31	1-10	11-20
Indo-China (French)	C	452	206	241	345			
Annam	C	388	146	106	140	27	13	75
Cambodia	C	8	25	42	67	5	56	1
Indo-China (French)—Con.								
Cochin-China	C	17	35	92	79	12	21	27
Laos	C	16			29	6	10	
Tonkin	C	23		1				

[1] From July 24 to October 8, 1927, 831 cases and 617 deaths from cholera were reported in Iraq. Of these 131 cases and 103 deaths occurred in Amarah; 416 cases and 337 deaths in Basra; 53 cases and 30 deaths in Diwaniyah; 7 cases and 5 deaths in Hillah; 31 cases and 18 deaths in Kerbala; 8 cases and 6 deaths in Kut; and 185 cases and 118 deaths in Muntafique.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C, indicates cases, D, deaths; P, present]

Place		Week ended—														
		September, 1927				October, 1927					November, 1927				December, 1927	
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	17
Algeria:																
Oran	C		1								1		1			
	D		1													
Argentina:																
Bahia Blanca	C													1		
Cordoba	C													10		
Firmat	C															1
Rosario	C													1		1
Quilino	C													1		
Unacha	C															1
Azores:																
St. Michaels Island	C		1		1	1			2	1						
	D		1			1										
British East Africa:																
Tanganyiki	D				10	10										
Canary Islands:																
Las Palmas	C						4	4	1			1				
Ceylon:																
Colombo	C	1		1	1	2	3					3				
	D	1		1	1											
China:																
Manchuria—																
Tungliao	C							P								
Mongolia	D							200								
Egypt:																
Alexandria	C	1												5	2	
	D													5	2	
Suez	C		1													
Greece:																
Mitylene	C				5											
Patras	C	2				1					1					
	D					1					1					
India	C	403	1,087	612	608	655	715	920	956	812						
	D	216	569	324	319	381	359	508	544	495						
Bombay	C	3	1	1	2		2		2							
	D	2	1	1	1		2		1							
Calcutta	C	18														
	D	10														

Place																
Madras	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]							
	D	76	62	43	49	60	72	72	84							
Rangoon	C	2		4		3	4	1	3	5	2					
	D	2		4		3	4	1	3	5	2					
Indo-China:																
Saigon	C		1	1												
Java:																
Batavia	C	18	14	17	21	24	33	42	31	41	29					
	D	18	14	17	21	24	33	41	31	41	29					
East Java and Madura	C	5	4	2	7	3	3	7	4							
	D	5	4	2	7	3	3	7	4							
Senegal	C				129											
	D				75											
Baol	C	32		27	13	39		56					P			
	D	11		15	7	26		14								
Cayor	C	87	103	175	104	101	45	20	10	32	28	8	P			
	D	27	58	90	58	57	16	10	5	20	4	4				
Dakar	C	9	5	5	1	1										
	D	4	4	3	1											
Louga	C				5		8									
	D				4											
Rufisque	C	4	9	2	1											
	D	3	7	1	1											
Thies	C	2		2	5					1						
	D	2		1	4											
Siam	C						1	11	1							
	D						1	8			1					
Bangkok	C						1		1		1					
	D	1									1					
Turkey:																
Constantinople	C				1	1										
	D					1										
Union of South Africa:																
Cape Province—																
Richmond District	C									2						
	D									2						

Place		July	August	September	October	November
Ecuador:						
Guayaquil	C	5	7	3	4	9
	D					3
Madagascar:						
Ambositra	C	6	1			
	D	6	1			
Antisirabe	C		34	5		
	D		34	4		
Itasy	C	14	11	21		
	D	14	7	20		
Madagascar—Continued.						
Moramanga	C	5	4	3		
	D	5	4	3		
Tananarive	C	21	48	142		
	D	19	43	127		
Peru	C	8	11			
	D	7	6			
Callao	D	3				

Algiers, Algeria, 2 cases, Oct. 11-20. Indo-China (French), 8 cases, Sept. 1-11; 5 cases, Sept. 11-20. Beirut, Syria, 1 case, Sept. 1-10.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Week ended—															
		September, 1927				October, 1927					November, 1927				December, 1927		
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17
Algeria:																	
Oran	C										10	4	6	9			
Arabia:																	
Aden	C												1				
Brazil:																	
Rio de Janeiro	C			3						1							
	D			6						1							
British East Africa:																	
Tanganyiki	D			8													
British South Africa	C		18					44			10						
Northern Rhodesia	D							1			23						
Canada	C	18	34	25		32	32	40	63	85	66	77	102	88	116	105	
Alberta	C	3	1	5	8	5	4	5	6	6	2	1	1	7	3	3	
Edmonton	C									1				6		1	
British Columbia:																	
Vancouver	C	2															
Manitoba	C	2		7			2		5	3	14		2	1	3	1	
Winnipeg	C			4			1		1				2				1
New Brunswick	C			2													
Nova Scotia	C			1				1									
Halifax	C																
Ontario	C			12	10	6	26		38	64	38	77	85	71	90	82	
Hamilton	C														2		
Kingston	C												1				
Ottawa	C	9	13	12	6	3	15	23	26	47	17	51	19	10	19		34
Toronto	C		1		1		3	1	6	2	16	3	13		25	16	
Windsor	C							9									
Quebec	C								8	7	3	12	3	8	5		
Montreal	C											1					
Reviere du Loup	C												3				
Saskatchewan	C	13	33		22	12		8	11	5	12	2	14	9	15	19	
Moose Jaw	C		9		7				3								
Regina	C						5					1					
China:																	
Chefoo	C				1			P		P							
	D				1												

Foochow	C		P					P	P		P						
Hong Kong	C	2															
	D	1		1													
Manchuria—																	
Fushun	C			1													
Mukden	C					1			1	1							
Pensihu	C					1											
Tientsin	C					12			1	8							
Egypt	C	3															
	D	1				1											
Great Britain:																	
England and Wales	C	111	146	128	125	122	149	124	200	199	219	258	226	233	366		
Bradford	C									1	5	3	2				
Bristol	C								6	1			3		4		
Cardiff	C									1							
Leeds	C	3				3	1		6	1	1	1	2		3		
Manchester	C						1	2			1	1			5		
Newcastle-on-Tyne	C					1		5		2			1	28	18		
Sheffield	C				1		3		4	4							
India	C	1,456	1,109	1,111	722	923	593	777	860	779							
	D	397	266	284	173	179	159	171	206	190							
Bombay	C	7	3	1	1	4	2		4	2		2					
	D	5	2	1					2	2		1					
Calcutta	C	4	6	10	2		4	1									
	D	2	5	5	2		3	1	1								
Madras	C	2		3	2	3	1	2	2	3		2	2	152			
	D			1	1					1		1		64			
Rangoon	C	2		1	6	2	8		7	4							
	D	1			1	1	1		1	1							
Indo-China:																	
Saigon	C		1														
Iraq:																	
Baghdad	C		1			5			2			5					
	D		1			3			1			4					
Basra	C			4				2									
	D			4				2									
Jamaica, outside Kingston (alastrim)	C	2	2	2	3	1	4	4		7				1			
Kingston (alastrim)	C	2		1			2										
Java:																	
Batavia	C					3		1			25						
	D										15						
East Java and Madura	C		14	3	5	1		7									
	D							1									
Mexico:																	
Guadalajara	D													1			
Torreon	D					2											
Portugal:																	
Lisbon	C	1		1	1	1	4	1	2	1	2						
Oporto	C		1														
Siam	C	24	3				3	3									
	D	14	1														

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Week ended—															
		September, 1927				October, 1927					November, 1927				December, 1927		
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17
Spain:																	
Malaga	D												1				
Valencia	C					1											
Union of South Africa:																	
Cape Province	C						P										
Venezuela:																	
Maracaibo	D			2			1										

Place		September, 1927			October, 1927		
		1-10	11-20	21-30	1-10	11-20	21-31
Algeria	C	110	162	110	182	386	
Oran	C	4		12	6		5
India, French Settlements in:							
Karikal	C				1		
	D				1		
India, French Settlements in—Con.							
Pondicherry	C	11	8	2	16		
	D	11	8	2	16		
Indo-China	C	6	6	9		4	
Syria. Damascus	C		1	4	14	8	

Place		July	August	September	October	November
Angola	C	42	2	5		
Brazil: Porto Alegre	C	5	3	3		
Chosen	C	19	2			
	D	6				
Ecuador: Guayaquil	C		2	2	1	1
France	C	23	6	8		
Gold Coast	C	1	1			
Latvia	C				2	
Mexico	D	93				
Morocco	C		76	51		
Nigeria	C	492	91			
	D	91	20			

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Week ended—														
		September, 1927				October, 1927					November, 1927				December, 1927	
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10
Algeria:																
Algiers	C													1		
Bulgaria:																
Sofia	C					8	4	3	2	3	1	2				
	D										1					
Chile:																
Antofagasta	C															
	D					1										
Valparaiso	C	1														
	D	1											1			
China:																
Tientsin	C				2											
Egypt	C					3	3	5	1		4					
	D					2	1	1	1							
Port Said	C					1									1	
Ireland:																
Cork County	C															3
Donegal County—Letterkenny	C								4							
Mexico:																
Mexico City (including municipalities in Federal District)	C	9	4	1	5	7		3	8	9	6	12	11	7		
	D										2					
Palestine	C	3					3						2	3	1	
Haifa	C						2						1	1		
Herzliah	C													1		
Jaffa	C					1								1		
Nazareth	C												1			
Safad	C													1		
Tel-Aviv	C						1							1	1	
Poland	C	12	5	12	6	10	9			35						
	D			2		3	1			6						
Portugal:																
Oporto	C									1						
Rumania	C	2	2	9	3	5										
	D					1										
Syria:																
Aleppo	C			2												

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Week ended—														
		September, 1927				October, 1927					November, 1927				December, 1927	
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10
Tunisia	C			1				2	1							
Union of South Africa:																
Cape Province	C	P				P	P	P	P							
Natal	C								P							
Orange Free State	C					P										
Transvaal—																
Johannesburg	C							5								

Place		September, 1927			October, 1927	
		1-10	11-20	21-30	1-10	11-20
Algeria	C	5	3	2	7	4
	D					1
Algiers	C	1	5		1	1

Place		September, 1927			October, 1927	
		1-10	11-20	21-30	1-10	11-20
Bulgaria	C	5	1	1		
	D		1	1		
Morocco	C	3	2	2	6	4

Place		July	August	September	October
Chosen	C	72	17		
	D	8			
Chemulpo	C	1	2		
Gensan	C	2			
Seoul	C	2	3		2
	D	1			1
Czechoslovakia	C	6			
Japan	C	1			

Place		July	August	September	October
Latvia	C	6			
Mexico	C				
	D	12			
Peru:					
Arequipa	D		2	1	2
Lima	D	8			
Yugoslavia	C	11	9		1
	D	4	1		

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Sept. 3, 1927	Sept. 10	Sept. 17	Sept. 24	Oct. 1, 1927	Oct. 15	Oct. 22	Oct. 29	Nov. 5, 1927	Nov. 12	Nov. 19
Liberia: Monrovia	C		1									
Nigeria	C			2								
	D			2								
Senegal	C					5		5	9	16	6	7
	D					5		4	8	10	4	6
Dakar	C			P					3	6		5
	D								2	4		4
Geoul	C					1						
	D					1						
Goree, Island of	C	2										
	D	2										
Kebemer	C						1	1				
	D						1	1				
Khombole	C					1						1
	D					1						1
Kelle	C						2		1			
	D						1		1			
Keur Samba Kane	C								1	1		
	D									1		
Keur Madicp	C								1			
	D								1			
Louga	C					1			2	1	1	
	D					1			2	1	1	
Senegal—Continued												
Mekhe	C							1	1	2	2	
	D								1	1	1	
M'Dande	C							1		2	1	
	D							1		1		
Pout	C				1							
	D				1							
Rufisque	C						1					
	D						1					
St. Louis	C					1						
	D					1						
Sebikotane	C							1		2	1	
	D							1			1	
Thies	C			1	2	1		1	1	2	1	1
	D			1	2	1		1	1	2	1	1
Tiaroye	C	1										
	D	1										
Tivaouane	C		1									
On vessel, S. S. Desirado, at Leixoes, Portugal	C			1								
	D			1								

Place		July	August	September	October
Gold coast	C	15	2	6	1
	D	4	2	4	1

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TREASURY DEPARTMENT

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JANUARY 13 - - 1928

SPECIAL ARTICLES

Typhoid Fever in the United States
Mortality Among American Negroes
Scarlet Fever: Prevention and Control
Reports of the Health Section, League of Nations

UNITED STATES
GOVERNMENT PRINTING OFFICE
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1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

PUBLIC HEALTH REPORTS

VOL. 43 JANUARY 13, 1928 NO. 2

PREVALENCE OF TYPHOID FEVER IN THE UNITED STATES

Preliminary reports from the health officers of 36 States for 50 weeks of 1927 show that the incidence of typhoid fever during 1927 was less than it was during the preceding two years. For 50 weeks in 1925 these States reported 30,700 cases of typhoid fever; in 1926, 25,600 cases; and in 1927 only 22,400 cases. The aggregate population of the 36 States is about 88,000,000.

The following table gives a comparison of the reports of cases of typhoid fever from these States for the 16 weeks from August 28 to December 17, 1927, with the reports for the corresponding period of the years 1925 and 1926.

Four weeks ended	1927	Corresponding weeks	
		1926	1925
Sept. 24, 1927	3,533	4,577	1,456
Oct. 22, 1927	2,680	4,045	3,805
Nov. 19, 1927	1,916	2,607	2,703
Dec. 17, 1927	1,218	1,479	1,928
Total	9,347	12,708	12,892

The typhoid fever case and death rates for 1925 were higher than the rates for the years from 1922 to 1924, inclusive, although the 1925 rates were lower than any ever recorded before 1920.

The typhoid fever death rate in the registration area of the United States dropped from 35.9 per 100,000 population in 1900 to 6.5 in 1926.

MORTALITY AMONG NEGROES IN THE UNITED STATES

At the request of Negro sanitarians for facts concerning mortality among American Negroes, Public Health Bulletin No. 174 has been prepared in the Office of Statistical Investigations with the idea of summarizing the data published annually by the Bureau of the

Census in order to make it available for persons working in the field of public health among Negroes. The bulletin is intended as a handbook and not as a study of any particular phase of Negro mortality.

Comparisons are made between colored and white mortality among populations of the same limited area, i. e., the Southern States of the death registration area, those States being selected as including the bulk of the Negro population and representing the Negro race in what might be considered its more nearly normal environment. For some purposes data for more Northern States have been presented.

Following is a brief outline of the data presented in the bulletin:

(1) The distribution and increase of the Negro population in the United States.

(2) Birth rate by States (1920) based on the female population 15–44 years of age.

(3) Mortality from all causes, specific for color, age, urban and rural areas of separate States, 1920.

(4) Mortality from important causes by color and at different ages, including such causes as pulmonary tuberculosis, pneumonia, organic heart, acute nephritis and Bright's disease, cancer, diphtheria, whooping cough, measles, and scarlet fever. These rates are based on the records for the Southern States of the death registration area and are for the year 1920.

(5) The trend of mortality from all causes for three southern cities, Baltimore, Charleston, and New Orleans, from approximately 1870 to 1923. The trend of important causes or groups of causes such as pulmonary tuberculosis, acute pulmonic diseases, cardio-renal diseases, cancer, diphtheria, whooping cough, scarlet fever, and measles is presented for the white and colored populations of New Orleans, from 1884 to 1921.

(6) Infant mortality by color and by separate cause for the birth-registration area of 1920.

Attention has been called to those diseases, such as tuberculosis and malaria, which are relatively more of a menace to the Negro race than to the white at the present time, and which offer a wide field to those in public-health work who are interested in furthering a knowledge of preventive measures against these diseases in the Negro race.

[Public Health Bulletin No. 174, containing this information regarding Negro mortality, may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy.]

SCARLET FEVER: ITS PREVENTION AND CONTROL

A revision of Supplement No. 21 to the Public Health Reports, issued November 27, 1914. The original article was prepared by Surg. J. W. SCHERESCHEWSKY. Revised, December, 1927, by Surg. R. E. DYER, *United States Public Health Service.*

Scarlet fever is regarded, by the informed, as one of the dreaded diseases of childhood, not only because an attack may be so malignant as to cause death in a short time, but also because of the many and grave complications with which it may be attended, and because the hope of recovery, even in cases apparently mild at the outset, has proved too often illusory.

This pamphlet is addressed to the general public, whose intelligent cooperation is necessary in all preventive measures against diseases, in the hope that it will aid, in some small degree, in spreading that knowledge of communicable diseases which should be in the possession of every citizen to enable him to do his share in their prevention.

Occurrence of scarlet fever.—Scarlet fever is more especially a disease of temperate climes, practically always being present in the large cities. In the United States it affects particularly the Northern States, being more prevalent there than in the South.

Scarlet fever and season.—Scarlet fever prevails during the colder months of the year. With the opening of the schools, the autumn months are always signalized by the marked increase in the number of cases of scarlet fever reported to health officers, each month showing a progressive increase until a maximum is reached in December and January. Only a small decline in the number of reported cases is shown in the spring months, but in July and August there is a great falling off, the number of cases reported being very much less than in the winter months.

Age and scarlet fever.—While scarlet fever may attack persons of any age, not even the very old being exempt, it is primarily a disease of infancy and childhood. The susceptibility to the disease becomes rapidly less with increasing years. From the figures for 1924, published by the Bureau of the Census, 44 per cent of the total deaths from scarlet fever in the registration area of the United States took place in children less than 5 years old, 70 per cent in children less than 10, 79 per cent in children less than 15, and 89 per cent in persons less than 25 years of age.

On the other hand, very young infants do not seem very susceptible to contracting scarlet fever. The disease is seldom seen in infants less than 7 months old. The disease, however, is very fatal to infants if they are attacked. The greatest susceptibility to scarlet fever falls between the second and the ninth year, over 66 per cent of the deaths from scarlet fever taking place in this age period.

The fatality of scarlet fever.—The virulence of scarlet fever is variable. In epidemics the percentage of those stricken by the disease who die varies from 1 to 15.

Age is an important factor, the rule being that the younger the patient the more fatal the disease.

The cause of scarlet fever.—For many years it has been known that certain germs called hemolytic streptococci are commonly present in the throats of acute cases of scarlet fever. Evidence was gradually accumulated through the painstaking researches of scientists throughout the world to show that these hemolytic streptococci might have a direct relationship to scarlet fever, culminating finally in the work of Drs. George F. and Gladys H. Dick, of Chicago. These two scientists succeeded in producing clinical scarlet fever in volunteers by using cultures of hemolytic streptococci which had been isolated from cases of the disease. As a result of this work, scarlet fever is now generally regarded as being caused by a hemolytic streptococcus. These germs are found in the throats of cases of scarlet fever and from them are transferred to the throats or nasal passages of other persons, where they multiply. These germs attack the mucous membranes lining the upper air passages, the earliest noticeable result being a reddening and soreness of the throat. As these organisms grow they produce a toxin (poison) which is absorbed by the body and causes the fever, rash, and toxæmia or symptoms of poisoning.

The symptoms of scarlet fever.—Some description of the symptoms of scarlet fever is desirable so that all may be on their guard against the disease. Its principal symptoms consist of sore throat, fever, rapid pulse, the breaking out of a bright-red rash (from which it takes its name) over the body and extremities, and usually swelling and tenderness of the glands of the neck. These symptoms are followed by a stage known as the period of desquamation, or peeling, during which the outer layers of the skin are shed in scales, flakes, or patches.

We can distinguish three well-marked stages in the course of an attack of scarlet fever:

1. The period of invasion.
2. The period of eruption.
3. The period of desquamation.

Period of invasion.—The disease strikes suddenly. A child, hitherto apparently in the best health, is seized with sore throat and fever, very often with vomiting, and, in infants, convulsions. The fever mounts rapidly, the skin feels unusually hot and dry to the touch, the tongue is furred, the throat parched, the face flushed and somewhat bloated. Cough and running of the nose are unusual. This stage usually lasts 24 to 36 hours.

Stage of eruption.—The rash usually appears on the second day, but may be deferred for 48 hours. On the other hand, it may begin to come out a few hours after the first symptoms. It appears first on the neck and chest as a breaking out of fine, scattered, bright points implanted on a scarlet flush. It spreads rapidly, so that by the evening of the second day the entire body may be covered. The eruption at its height has a vivid scarlet hue and is more marked on the inner surfaces of the arms and legs and where joints make folds of the skin, as in the groins and at the elbows.

In some cases the rash is patchy instead of uniform, with islands of normal skin. At other times tiny elevated patches appear, as in measles, but this is not so common as in measles.

In malignant attacks bleeding may take place in the skin, causing large purplish patches.

After persisting at its height for two or three days, the rash gradually fades, the fading being accompanied by a progressive fall of the fever.

Period of desquamation or peeling.—With the fading of the eruption and the fall of the fever the skin looks stained and feels rough. Gradually its outer layers begin to be thrown off, the process usually beginning about the neck and chest. The amount of peeling usually bears some relation to the previous intensity of the rash. When this has been vivid and its duration prolonged, large flakes and patches come away. Rarely the nails and hair are shed. On the other hand, with mild eruptions the peeling may be much less marked, consisting of branlike particles only. The entire pr ess lasts 10 to 20 days.

Throat symptoms.—Inflammation of the throat is a prominent symptom in scarlet fever. This is present in various grades and may vary from redness of the hard palate and inner surface of the cheeks, with some swelling and more vivid redness of the soft palate and tonsils, to the condition known as "diphtheroid," with much increased swelling and inflammation of the tonsils and neighboring parts, with extensive formation of a membrane over the tonsils and soft palate.

In these severe cases extensive membrane formation in the throat may lead to death of the underlying tissues, so that large sloughs form. The swelling of the glands and soft parts of the neck may be so extensive that breathing is interfered with and death ensues from suffocation, or deep abscesses form, endangering life and markedly prolonging convalescence.

The tongue in scarlet fever.—The tongue in scarlet fever has a characteristic appearance. At the outset of the disease it is coated with white, the edges being red. The little papillæ or prominences with which the tongue is studded emerge through the white coating and can be seen as little red points dotting the white surface.

Somewhat later in the disease the white coating disappears, leaving the tongue rough and red, often glazed. The papillæ remain considerably swollen, and this, together with the beefy appearance of the tongue, constitutes a condition characteristic of scarlet fever, which the writers describe as the "raspberry tongue."

Types of scarlet fever.—Scarlet fever shows marked variations in its severity. There are mild or abortive cases in which the rash is scarcely visible, or in which the sore throat and the "raspberry tongue" may be the only signs of the disease. In certain epidemics, particularly in schools, this type of the disease may constitute over a third of the cases.

On the other hand, the symptoms may be so severe that the patient, overwhelmed by the poison of the disease, may die within 24 to 36 hours, with high fever, great restlessness, delirium, and convulsions.

In other cases the throat symptoms are prominent and may be of the utmost severity. Rapid and thick membrane formation takes place which may extend into the interior of the nose, and into the ears through the Eustachian canals (openings of the ear into the throat). Death may ensue from suffocation, due to the swelling of the soft parts, or gangrene may set in, causing a fatal issue. Convalescence may be much delayed by persistent enlargement of the neck glands and the formation of deep abscesses in the neck, or by purulent discharges from the nose.

The complications of scarlet fever.—Scarlet fever is distinguished by the variety and severity of its complications, which may develop in cases apparently mild at the outset. The most common of these are inflammation of the kidneys (nephritis), ear complications (middle-ear disease), inflammation of the lining membrane of the heart (endocarditis), inflammation of lymph glands (adenitis), and joint affections. Of these, nephritis and ear complications are by far the most common.

Inflammation of the kidneys (nephritis).—Inflammation of the kidneys may develop, usually in the second or third week of the disease, even in the mildest cases. The symptoms vary greatly in severity from instances in which the condition is shown only by the presence of albumen in the urine, pallor, and slight swelling of the eyelids and feet, to those of greater severity with scanty urine loaded with albumen and general swelling of the body, or to the severe and rapidly fatal cases with scanty, bloody urine or urine completely suppressed, with vomiting, convulsions, and loss of consciousness.

There is evidence to the effect that an attack of scarlatinal nephritis, even if apparently recovered from, may predispose the individual later in life to develop chronic kidney disease.

Ear complications.—These are very common. They are caused by an extension of the throat inflammation to the interior of the ears through the canals by which they open into the throat. The inflammation may extend to the bony cells of the temporal bone behind the ear, causing mastoid disease; the hearing may be destroyed, or the inflammation may extend to the brain, causing dangerous brain complications. The ear complications of scarlet fever are a common cause of deafness.

Infectiousness of scarlet fever.—It is indeed fortunate that scarlet fever does not show the very ready communicability of measles or whooping cough. Rather intimate contact with the sick seems to be required to transmit the disease. Observations have been made which allow us to estimate roughly the frequency with which persons, after exposure, contract the disease. These show that about 30 per cent of children sicken with scarlet fever after exposure, while in the case of measles about 99 per cent of those unprotected by a previous attack will take the disease under like conditions.

Period of incubation of scarlet fever.—While the average period of incubation of scarlet fever (i. e., the period between exposure and the appearance of symptoms) has been stated to be from 2 to 4 days, probably with a maximum of 7, a few examples of what seem to be longer periods are recorded.

Portal of entry of the scarlet-fever germ.—All the evidence tends to show that the mouth is the usual gateway through which the germ of scarlet fever enters the body.

How scarlet fever is "caught."—Each new case of scarlet fever is derived from some previous case of the disease. The scarlet fever germ is present in the discharges from the mouth, nose, and throat of the sick. When there is a discharge from the ears, as a result of ear complications, this discharge also may be infectious. This is true of other pus discharges, as from abscesses. The urine, too, in cases of scarlatinal nephritis, and matter vomited at the onset or during the course of the disease, may contain the infecting agent of scarlet fever.

The disease is transmitted from those sick with scarlet fever to the well who come in contact with them because these discharges get on the hands or mucous membranes of such persons. The infection is caused by direct contact, as by kissing, or by being sprayed with the infected nose and throat discharges, in the act of coughing, sneezing, or talking (droplet infection), or indirectly through various objects, such as drinking cups, candy, apples, pencils, pocket-handkerchiefs, towels, and the like which have been placed in the mouth or infected with the discharges of those sick with scarlet fever.

It has often been pointed out that the chief factor in the spread of such diseases as scarlet fever and diphtheria is the freedom with

which the fluids of the mouth are exchanged among human beings, especially among children. But little observation is needed to convince us of the frequency, during the day, with which the hands are carried to the mouth and then handle objects in common use. This tendency is, of course, greatest among children.

Duration of the communicability of scarlet fever.—Scarlet fever can be transmitted from the time of onset until the infectious agent is no longer present in the mucous membranes of the nose and throat nor in unnatural discharges, as from a running ear which has appeared as a complication in an attack of the disease.

On account of the difficulty of definitely identifying the germ of scarlet fever it has thus far not proved feasible to determine the duration of communicability of scarlet fever by throat culture, as is done in the case of diphtheria. In the majority of instances it is probable that uncomplicated cases of scarlet fever are no longer infectious in the fourth week of the attack.

Scarlet fever "carriers."—The spread of a number of communicable diseases is assisted by the agency of "carriers," i. e., apparently well persons who harbor in their bodies and spread the germs of a particular disease. The agency of "carriers" is important in disseminating such diseases as diphtheria, typhoid fever, cerebrospinal meningitis, cholera, and scarlet fever.

These carriers consist of the "missed cases," viz, those persons who have suffered from scarlatinal sore throat alone, without a recognized eruption; who have not been sick enough to go to bed or, possibly, even complain of their symptoms, and the convalescent "carrier," the child, who after an attack is allowed to mingle with his playmates too soon, or who continues to harbor the contagion in his nose and throat for a long time after apparent recovery. Such persons undoubtedly play an important part in spreading scarlet fever.

Milk-borne scarlet fever.—There are numerous records of outbreaks of scarlet fever in which the infection was conveyed by milk. These outbreaks were usually of an explosive character, an unusual proportion of adults were attacked, and the disease was often severe. In every instance the source of the infection was shown to be due to the presence of persons suffering from scarlet fever, either on the dairy farm or among the persons engaged in handling the milk.

Immunity to subsequent attacks of scarlet fever.—The protection against future attacks conferred by a single attack of scarlet fever usually seems strong and lasting, although second and even third attacks of the disease have been observed. Relapses also are occasionally noted, i. e., a child, apparently well upon the road to recovery, sickens anew and goes through a second siege of the disease with all its attendant symtoms, including peeling.

Complication with other infectious diseases.—It must not be supposed that, because a person is suffering from scarlet fever he is thereby protected from having other communicable diseases at the same time. Scarlet fever has frequently been observed to be complicated with measles or diphtheria.

Prevention of scarlet fever.—It is plain, from what has been said, that scarlet fever is no disease to be lightly held To infants and young children it is a very fatal affection. Yet, in spite of its communicability, it is by no means a disease which "every child is bound to have sooner or later." The folly of the complacent attitude which permits the exposure of children to the diseases of childhood "so that they may have them over and done with" can not be too strongly condemned. If we succeed in protecting our children from scarlet fever during childhood, the chances that they will suffer from the disease later will be very greatly reduced. By so doing we will have protected them from what constitutes a very real menace to their lives, or to their subsequent physical efficiency.

Within recent years the Doctors Dick of Chicago have developed a test to determine susceptibility to scarlet fever. This test is called the Dick test and is similar to the Schick test for determining susceptibility to diphtheria It consists in injecting a minute amount of the scarlet fever streptococcus toxin or poison into the skin (usually of the forearm). If the child is susceptible, a red area about the size of a dime, or larger, will appear at the site of injection in about 24 hours.

The scarlet fever streptococcus toxin is made by growing the hemolytic streptococci of scarlet fever in broth for a few days. The germs are then carefully filtered out, while the toxin, being soluble, remains in the broth.

In addition to using this toxin to test susceptibility to scarlet fever, larger amounts of the same toxin may be given to susceptible individuals to render them insusceptible. When this ability to resist the toxin is developed by injecting the toxin, it appears within a few weeks. At present five doses are given to susceptible persons, at weekly intervals.

This method of immunization is especially useful in institutions, and in the protection of nurses who are about to undertake duty in the care of cases of scarlet fever.

Diagnosis of scarlet fever.—While the responsibility for the diagnosis of scarlet fever must rest upon the attending physician, the citizen can be of material assistance in limiting the spread of scarlet fever by being constantly alive to the possibility of outbreaks of the disease in his family. If a child be suddenly taken with vomiting, and fever, or with dryness, tickling, or soreness of the throat, if soreness of the throat alone be complained of, or if any rash be dis-

covered on the body in absence of other symptoms, no time should be lost in isolating the child and calling in a physician in order to ascertain the nature of the disorder as promptly as possible. It is the mingling of children sickening with a communicable disease with other children before its nature has been determined which helps to spread such diseases.

A great deal could be accomplished in the way of controlling the communicable diseases of childhood if it were the invariable rule in every household to isolate all children from other children as soon as they become ill until the nature of the sickness has been made out, especially when such illness is accompanied by sore throat, running nose, or huskiness of the voice.

The care of scarlet fever in the home.—The important principle to remember, in the care of scarlet fever, is that a child sick with scarlet fever who is carefully isolated does not transmit the disease.

The sick room.—The first rule, therefore, in the care of scarlet fever is to place the patient at once in a separate room. This room, if possible, should be on the story of the house the least in use, its adaptability for sick-room purposes being considered. The furniture left should be reduced to strict necessity and be of a kind readily cleansed.

There should be no such fancied attempts at purifying the air as by hanging up sheets wet with disinfectants. Such measures are not only useless but tend to give a false sense of security.

Separate linen, bedclothes, etc.—The patient should be provided with separate bedclothing, nightgowns, towels, eating utensils, and drinking vessels for his exclusive use. These should be kept rigidly separate from those used by the rest of the family. After use they are to be soaked for an hour or two in one of the disinfectant solutions given below, or better, boiled in soapsuds.

Attendant for the patient.—The patient should be provided with an attendant who remains with him and holds no communication with the other members of the family. This attendant should be the only person coming in contact with the patient apart from the attending physician.

Use of disinfectants.—The best method of disinfecting articles used by patients is by boiling. Discharges from nose and throat of patients may be received into pieces of cotton gauze or old, clean squares of linen, which should be burned immediately after use. In case it is found impracticable to practise the above procedure, a tub of good disinfectant solution should be provided for soaking articles used by the patient. The following are proper disinfectant solutions:

1. Two per cent solution of phenol (carbolic acid.)
2. Two per cent solution of liquor cresolis compositus, U. S. P. (compound solution of cresol).

A 2 per cent solution is made by adding 3 ounces (6 tablespoonfuls) of disinfectant to 1 gallon of water. Surfaces soiled with discharges from scarlet-fever patients should at once be flooded with the disinfecting solution. Partially eaten food should also be disposed of by burning. Dishes used by the patient should be boiled before being removed from the sick room.

Care of the patient during peeling.—During desquamation the process is facilitated by rubbing the body with some bland unguent like olive oil or cocoa butter.

Care of the attendant's hands.—It is important to remember that the hands become readily infected when caring for scarlet fever patients. Unnecessary handling of the patient, therefore, should be avoided. Whenever contact is necessary the hands should be cleansed in hot soapsuds.

Other precautions for the attendant.—A loose gown or wrapper and a head covering should be provided for the protection of the attendant's hair and clothing. These coverings should always be regarded as infected, and not sent out of the room until they have been boiled or soaked in disinfectant for an hour. The attendant should wear dresses of material not injured by disinfecting, as these should also be disinfected. Gowns and head coverings should also be provided for the attending physician. These are kept outside the room.

Ventilating and cleansing the room.—There is little tendency to "catch cold" in scarlet fever. The bedclothes should be light and the room aired thoroughly several times a day and well ventilated at all times. No sweeping should be done, but the floor and furniture wiped with cloths dampened in disinfectant solution instead. After use the cloths should be soaked in disinfectant solution.

Subsequent cleansing and disinfection of the sick room.—The cleansing and disinfection of the sick room after recovery from scarlet fever will, in cities, be governed by the regulations of the local health office; but cleansing and airing of the sick room should always be done. When the householder must follow his own initiative in the matter, his reliance should be placed upon thorough cleansing of the room with soap and water, and upon the action of fresh air and sunlight. Gaseous disinfection is not only probably useless but creates a false sense of security.

Treatment of children who have been exposed to infection.—When a case of scarlet fever occurs in a family, the other children have probably been exposed to infection. As has been previously stated, there is a good chance, though exposed, of their escaping the disease especially if isolation of the sick has been prompt and thorough. It is therefore advisable to send such children away at once to friends or relatives not having small children of their own. While there they

should be carefully observed for symptoms of commencing scarlet fever until the incubation period has passed. If they are school children, they should be kept away from school during this time. The adult members of the family, however, who are not sick, may come and go, provided the house is so arranged that they do not come in contact with the patient. They should wash the hands and face carefully before leaving the house.

As the protection following the immunizing injections of scarlet fever streptococcus toxin develops rapidly, many contacts may be protected in this manner. Before beginning the immunization of exposed persons they should be given the Dick test to determine susceptibility. At the time the test is performed, throat and nose cultures should also be made to determine the presence or absence of hemolytic streptococci. If by the test the child is shown to be susceptible and shows no signs of oncoming scarlet fever, such as slight elevation of temperature or sore throat, the first immunizing dose may be given at once. An exposed child who, in addition to having a positive Dick test also harbors the germs in the nose and throat, should be examined carefully each day for signs of developing the disease, and no further injections of toxin gi n as long as such symptoms persist.

Exposed children who are positive to the Dick test and who show symptoms of oncoming scarlet fever may be given an early therapeutic dose of scarlet fever streptococcus antitoxin.

Reporting the case.—An important step in the control of any communicable disease lies in the knowledge of its prevalence by the sanitary authorities. It is a public duty to report cases of scarlet fever.

It is likewise the householder's duty to observe scrupulously all regulations made by local health authorities in regard to the quarantine of scarlet fever cases.

Other precautions to be observed.—As scarlet fever is capable of transmission through milk, it is important that a vessel be placed outside the house, as on the porch, into which the milkman may empty the milk. This will prevent the bottles from becoming infected in the house. Milk bottles once admitted to the house should not be returned to the milkman before they are thoroughly disinfected by complete immersion in water, actually boiling. In no case should any member of the family coming in contact with the sick handle the bottles.

When a household in which there is a case of scarlet fever is engaged in any occupation having to do with the handling or distribution of food, such as the grocery business, dairying, the making of ice cream, and the like, such business should be discontinued as long as the case of scarlet fever remains on the premises, or until the patient has been

removed to a contagious-disease hospital, and other members of the family observed for a sufficient length of time to assume their escape from the infection.

The public control of scarlet fever.— It is evident from the foregoing that the proper care of scarlet fever in the home is no easy problem even in the most intelligent and well-to-do families. Thorough isolation of the sick in the tenement districts of cities is well nigh impossible.

Under such conditions the control of the spread of scarlet fever must be in the hands of the local sanitary authorities. The most important equipments to this end are: First, adequate contagious-disease hospitals to which those suffering from scarlet fever may be removed, when it is clear, from an inspection of the premises, that cases of scarlet fever can not remain at home without danger of spreading the disease; second, an efficient corps of inspectors and nurses for the visiting and sanitary control of the cases of scarlet fever reported; and, third, an adequate system for the medical supervision of school children, so that cases of scarlet fever shall be early detected and the proper precautions taken before the infection has had a chance to spread among the pupils. Teachers also can aid greatly in the control of scarlet fever by being familiar with the symptoms attending its onset, encouraging their pupils to let them know whenever they feel sick, removing at once from the classroom any child having sore throat or seized with sudden vomiting, and reporting their action at once to the proper authorities. The school nurse and the school physician are indispensable agents in limiting the spread of scarlet fever in the schools.

School authorities will materially contribute their share by abolishing in schools the common drinking cup, the common towel, the common lead pencil, which, though slowly vanishing, are still too frequently encountered in our schools.

Immunization of susceptible persons by use of injections of toxin may be used especially where the chances of exposure are apt to be great. The immunizing toxin has been used too short a time to warrant a statement as to the permanence of the immunity so produced.

In case of death from scarlet fever, public funerals should not be allowed, because when many persons gather in and about a house in which disease has occurred there is great danger that some one may catch it. The danger is not from the dead body, if properly prepared, but from members of the afflicted household, some of whom may be carrying the germs in the throat and nose, and may even be on the verge of coming down with the disease.

General precautions against scarlet fever.—The body presents a natural resistance to contracting communicable diseases. We do not

catch these diseases unless either the dose of the infecting germ has been sufficient or the natural resistance of the body is deficient.

Attention has already been called to the mouth, nose, and throat as gateways of infection in scarlet fever. Certain diseased conditions of these regions of the body, such as defective teeth, diseased tonsils, and adenoids, probably make them more vulnerable as gateways of infection. Care should be taken, therefore, early to correct such faulty mouth, nose, and throat conditions in children, for by so doing, not only do we strengthen a weak part of the body defenses, but we effect thereby a notable improvement in the general health besides removing conditions known to exert an unfortuanate influence upon the subsequent physical or even the mental development.

While it is realized that it is instinctive for the child habitually to carry all objects to the mouth, it is well worth while, on the part of parents and guardians, to teach children, as early as possible, that the only substances which naturally belong in the mouth are food and drink. The danger of such practices as putting lead pencils, coins, and similar objects in the mouth, the use of the common towel and drinking cup, taking bites of the same apple or stick of candy, the failure to turn the head away when coughing or sneezing, and, in a word, all acts which lead to an exchange of the mouth fluids between human beings should be regarded as one of the earliest and most practical essentials of the education of children.

CURRENT WORLD PREVALENCE OF DISEASE

REVIEW OF THE MONTHLY EPIDEMIOLOGICAL REPORT OF THE HEALTH SECTION OF THE LEAGUE OF NATION'S SECRETARIAT, NOVEMBER 15, 1927 [1]

Plague.--There were few plague cases in the Mediterranean area in September and October. In Egypt no cases were reported from September 4 to October 14. In Greece 6 cases were reported in September and 3 in October, all at Plomarion on the island of Mytilene. In Tunis no plague case had been notified in the 10 weeks ended October 23. In Algeria there was 1 case at Oran and 1 at Philippeville in September and 2 cases at Algiers between October 11 and 15.

At Las Palmas, in the Canary Islands, 4 plague cases were reported on October 10.

Plague incidence in Senegal in September (708 cases) was higher than in any month of the preceding two years. The epidemic seemed to have abated in October. In Nigeria, on the other hand, only 8 cases were reported in August, as compared with 187 cases in the corresponding month of the preceding year. The Report states:

> No plague case has been reported in Angola since March and none in the Union of South Africa since the first week of August. Reunion has been free from plague

[1] From the Office of Statistical Investigations.

since January. Plague has again spread in Madagascar since the beginning of August; 170 cases were reported in September, which is about the same as during the corresponding month of 1926. The season of low plague incidence has come in Kenya and Uganda; the number of cases reported is about the same as last year.

In northern India, during the 13 weeks ended September 24, only 119 cases of plague were reported in the area reaching from Assam in the east to the Northwest Frontier Province in the west. In 1926, 424 cases were reported in this area during the corresponding weeks, and in 1925, 1,298 cases. The incidence in Bombay Presidency, in Madras Presidency, in Mysore, in Hyderabad, and in the central Provinces was somewhat lower than in 1926, but the disease was fairly prevalent; 1,220 cases were reported in all of India in the two weeks ended September 24, nearly all of which were in the aforementioned Provinces.

Information was received from the North Manchuria Plague Prevention Service and from the government of the Kwantung Territory concerning a plague outbreak in September near Payintala (also called Tungliao) in the eastern part of Inner Mongolia. The Report gives the following details:

Payintala is a town of about 20,000 inhabitants and the terminus of a branch railway which joins the South Manchuria Railway system at Chien-Chia-Tun, from which there is a railway to Szepingkai on the Mukden-Harbin line. It is believed that lamas coming from the interior of Mongolia at the end of August brought the infection to the villages situated about 17 miles north of Payintala. Several inhabitants in three small villages in this area were infected and died. Two families lost 14 and 13 members, respectively. Altogether there were 50 or 60 deaths. The symptoms were those of pneumonic and bubonic plague, but cultures were not obtained. The last case occurred on October 3, according to information from Harbin dated October 21. Chinese and Japanese plague prevention services are on the spot and all precautions have been taken on the railway lines.

Cholera.—Cholera was unusually prevalent in Asiatic ports during the past summer and autumn. Twenty-six of the ports reporting to the Singapore bureau were infected at one time or another from July 31 to October 29; and the cases reported numbered 1,657. Many more cases than in the preceding year occurred in ports from Madras westward, but there was less cholera in Bangkok and several other ports in eastern Asia. The situation had improved in October, especially in the ports west of Calcutta. During the four weeks ended November 5, cholera cases were reported, mostly sporadically, in 10 ports—Basrah, Tuticorn, Madras, Calcutta, Rangoon, Singapore, Bangkok, Canton, Amoy, and Shanghai. In the first week of October, an outbreak of cholera was reported at Lingah, a Persian port on the Strait of Ormuz.

In October the cholera epidemic in Iraq was under control in the centers first affected. Abadan and Mohammerah have been free

from cholera since the beginning of September and Basrah had only 3 cases in October. The infection spread, however, farther west and north along the Euphrates.

The incidence of cholera in India, which had remained at a high level ever since the end of March, began to decrease after the middle of September. The deaths in the various provinces are shown by fortnightly periods in Table 1.

TABLE 1.—*Deaths from cholera in the Provinces of India, by fortnightly periods, from June 5 to September 24, 1927*

Province	June 5 to June 18	June 19 to July 2	July 3 to July 16	July 17 to July 30	July 31 to Aug. 13	Aug. 14 to Aug. 27	Aug. 28 to Sept. 10	Sept 11 to Sept. 24
Punjab and Delhi	193	934	1,312	986	275	351	200	158
Punjab States	71	215	269	205	13	37	9	129
United Provinces	3,430	2,036	1,270	1,126	903	617	248	213
Central India Agency	85	128	490	381	276	411	518	*62
Bihar and Orissa	4,373	3,994	2,716	2,877	2,254	2,176	1,343	851
Bengal	707	501	444	650	679	672	530	*344
Assam	375	202	110	89	178	295	292	311
Central Provinces	1,196	977	728	696	818	1,986	2,596	1,723
Madras Presidency	1,196	1,405	2,455	2,352	1,975	1,538	985	596
Hyderabad	56	111	322	653	1,097	1,312	1,777	1,095
Bombay Presidency	1,269	1,234	1,494	1,814	2,291	2,014	1,206	506
States in Bombay Presidency	85	227	192	246	170	36	24	9
Burma	112	78	73	141	162	118	63	66
Other Indian States	3	177	94	17	18	27	4	6
	13,151	12,219	11,969	12,233	11,109	11,590	9,885	6,069

* One week only.

A small outbreak of cholera in the Federated Malay States began in June and had terminated early in September; 108 cases and 73 deaths were reported.

Cholera was less prevalent in China during the past summer and autumn than a year ago. The Report states:

In the course of August and September outbreaks occurred at Swatow, Macao, Canton, Hong Kong, Amoy, and Shanghai; but the number of cases was much smaller than in 1926. The infection spread as far north as Tien-Tsin, Chingwang-Tao, Newchwang, and Dairen, but there were only a few cases in each locality.

There has been no cholera this year in Chosen.

Yellow fever.—The Report says:

Twenty cases of yellow fever were reported in September among the European population of Senegal, of which 17 were at Dakar and Goree and 2 at Thies. In October, cases continued to occur at Dakar and Thies and appeared also in various inland localities, especially on the railway line from Dakar through Thies to St. Louis. Twenty cases were reported during the first 18 days of October, of which 5 were at Dakar, 9 at Thies, and 1 at Rufisque, the remainder in small inland villages or smaller towns. Between October 19 and November 2 inclusive, 20 cases were reported, of which 8 were at Dakar and 2 at Thies, the remainder being scattered in six villages. Twelve of these cases were among Europeans, 6 among Syrians and 2 among half-breeds. Preventive measures and search for suspected cases are being actively pursued.

Six cases were reported in September in the Gold Coast Colony, mostly in the Volta River district. According to information up to the end of October, the last case occurred at Accra on September 23 and at Cape Coast on August 10. Two yellow fever cases were reported in Nigeria in September.

Smallpox.—The incidence of smallpox in England and Wales showed a seasonal increase in October, but was not higher than at the corresponding date of 1926.

Smallpox continued very prevalent in Algeria, especially in the Department of Oran. It is less prevalent than in previous years in Tunis and in Egypt.

Smallpox has been more prevalent in 1927 in Nigeria than for several years. According to the report, "3,567 cases and 814 deaths, which mostly occurred in the northern Province, were reported during the first nine months of the current year. The case mortality rate was 22.8 per cent; last year it was 20.6 per cent among hospitalized cases. The number of cases increased from 91 in August to 237 in September."

In India, the smallpox incidence has returned to a more normal level, after severe outbreaks in the first half of the year in Bengal, Bihar and Orissa. In the four weeks ended September 24, 4,440 cases were reported, as compared with 6,738 during the corresponding period of 1926.

The incidence of "alastrim" has declined in Jamaica, "202 cases having been reported during the first nine months of the current year as compared with 961 cases during the corresponding period last year. The number of cases has usually been between 1,000 and 2,000 in previous years."

Enteric fever.—"Enteric fever is less prevalent in Germany, the Netherlands, and Sweden than in any previous year," states the Report. "In other European countries, there was no marked improvement in comparison with last year; in some countries the incidence was considerably higher than usual. More cases than last year were, for instance, reported in all the countries southeast of a line drawn from Poland to Italy. In Italy, there were 6,268 cases during the four weeks ended September 4, as compared with 4,415 during the corresponding period of the preceding year. In Greece, 2,012 cases were reported during the first nine months of the year, as against 523 cases during the corresponding period of 1926. The incidence was higher than usual in Egypt."

Dysentery.—In Germany the incidence of dysentery was lower in recent months than in previous years; only half as many cases were reported in October as during the corresponding month of 1926. On the other hand, there were more cases than last year in Poland, where 1,102 cases were reported during the four weeks ended October

15, as compared with 719 cases during the corresponding period of the preceding year. There was a marked increase over last year also in Rumania. The fluctuations in dysentery from year to year in these countries seem to correspond with those for enteric fever, but the former are greater than those of enteric fever, according to the Report.

Acute poliomyelitis.—There was a general decline in the incidence of poliomyelitis in October. Among countries for which reliable statistics are available, the incidence was markedly higher than in the preceding year only in the United States, Germany, Austria, and Sweden.

The outbreaks in Germany reached their maximum during the last week of September, when 240 cases were reported. The area principally affected comprises the districts of Leipsig and Merseburg, in which the epidemic was particularly severe, Dresden, Chemnitz, Magdeburg, Potsdam, Arnsberg, Cassel, and Thuringia.

The incidence of poliomyelitis in 1927 and in previous years in various European countries is shown in Table 2.

TABLE 2.—*Poliomyelitis cases reported in various European countries during the first nine or ten months of the years 1923–1927*

Country	Jan. 1 to—	1923	1924	1925	1926	1927
England and Wales	Nov. 5	521	744	361	994	788
Sweden	Oct. 31	215	555	438	286	293
Finland	Oct. 15	36	39	23	11	45
Denmark	Sept. 30	42	91	86	41	21
Germany	Oct. 22	-----	393	312	1,329	2,088
The Netherlands	Nov. 5	-----	34	31	44	26
Switzerland	do	193	93	81	82	91
Austria	Oct. 15	-----	-----	8	23	115
France	Sept. 30	132	168	153	148	113
Italy	Sept. 4	-----	-----	411	217	164

Diphtheria.—In recent months, according to the Report, there has been an increase in diphtheria over the 1926 incidence in nearly all European countries, although the 1926 incidence was higher than that for preceding years in most countries. Comparison of recent statistics for 1927 with corresponding figures for 1926 is given in Table 3.

TABLE 3.—*Comparison of diphtheria prevalence, 1926 and 1927*

Country	Period	Number of cases	
		1926	1927
England and Wales	Oct. 9–Nov. 5	4,562	5,608
Sweden	October	349	471
Germany	Sept. 25–Oct. 22	2,331	2,760
Poland	do	708	957
Czechoslovakia	Sept. 16–Oct. 15	492	774
Italy	Aug. 8–Sept. 4	736	957

Similarly in the United States, where the incidence of diphtheria had decreased steadily since 1921, the October incidence exceeded that for October, 1926.

Scarlet fever.—Most European countries showed a lower incidence for scarlet fever in September and October than at the corresponding season of 1926. In Sweden, Poland, and the Baltic Republics teh decrease was very marked. There was an increase, on the other hand, in England and Wales, Germany, Austria, Czechoslovakia, the Kingdom of the Serbs, Croats and Slovenes, and Bulgaria.

The mortality from scarlet fever in 1926 in the principal towns of Europe indicates that the disease causes a much heavier mortality in Russia and Poland than in central, northern, and western Europe.

DEATH RATES IN A GROUP OF INSURED PERSONS

Rates for Principal Causes of Death for September and October, 1927

The accompanying tables are taken from the Statistical Bulletin for October and November, respectively, published by the Metropolitan Life Insurance Co., and present the mortality experience of the industrial department of the company for September and October, 1927, as compared with the preceding months and with the corresponding months of 1926. The rates are based on a strength of approximately 18,000,000 insured persons in the United States and Canada.

SEPTEMBER, 1927

The death rate for September was 8.0 per 1,000, as compared with 8.1 for August and with 8.3 for September a year ago. The rate this year is the lowest recorded for the month of September since 1923, when it was 7.9 per 1,000. The rate also shows a slight improvement over that for the preceding month.

The typhoid fever death rate, for the first time since the beginning of the Montreal outbreak last spring, recorded a lower figure than for the corresponding month last year; and for the first month in 1927 the diphtheria death rate was not higher than for the corresponding month a year ago.

Favorable conditions for September were also shown for tuberculosis and diarrheal complaints.

Death rates (annual basis) for principal causes per 100,000 lives exposed, September, 1927, as compared with August, 1927, and with September, 1926

Cause of death	Rate per 100,000 lives exposed[1]			
	September, 1927	August, 1927	September, 1926	Year 1926
Total, all causes	801.4	806.8	826.5	945.6
Typhoid fever	5.2	5.6	8.5	4.2
Measles	.5	1.7	1.9	10.2
Scarlet fever	1.6	1.8	1.1	3.4
Whooping cough	6.4	7.0	9.1	9.6
Diphtheria	6.6	7.5	6.6	9.7
Influenza	5.2	4.5	4.7	31.1
Tuberculosis (all forms)	80.7	90.6	90.9	99.0
Tuberculosis of respiratory system	70.3	79.3	80.2	86.7
Cancer	72.7	74.3	73.9	73.7
Diabetes mellitus	14.3	15.4	15.3	16.7
Cerebral hemorrhage	49.9	44.6	46.8	55.6
Organic diseases of heart	114.8	114.6	106.7	134.3
Pneumonia (all forms)	37.3	38.2	36.8	98.2
Other respiratory diseases	12.8	11.2	9.1	13.0
Diarrhea and enteritis	47.0	35.9	64.5	29.8
Bright's disease (chronic nephritis)	62.8	61.0	61.3	73.5
Puerperal state	12.5	14.6	11.7	15.3
Suicides	8.0	8.7	9.1	7.7
Homicides	5.3	6.9	6.6	7.0
Other external causes (excluding suicides and homicides)	68.2	73.1	69.6	62.3
Traumatism by automobiles	22.2	19.7	20.9	16.8
All other causes	189.7	189.6	192.0	191.0

[1] All figures include infants insured under 1 year of age.

OCTOBER, 1927

The death rate for this group of persons for October, 7.7 per 1,000, was not only the lowest rate reported for any month during the current year, but the lowest recorded for this month in the records of the company.

The typhoid fever death rate continued to decline and was 3.7 per 100,000 as compared with 5.2 for September and with 6.3 for October a year ago.

The diphtheria situation also showed improvement over last year, the death rate for October being 9.6 as compared with 10.6 in 1926. The other three principal diseases of childhood registered lower mortality than in October last year.

The tuberculosis death rate shows a decline from the rate for 1926; in fact, with a single exception, every month of 1927 has shown improvement over 1926 in tuberculosis mortality, and a new low figure for this disease seems assured for 1927.

Influenza, pneumonia, diarrheal complaints, and Bright's disease are other important causes of death to show lower rates in October than were recorded a year ago, while the number of deaths from cancer, diabetes, cerebral hemorrhage, and heart disease increased—slightly in each instance.

Death rates (annual basis) for principal causes per 100,000 lives exposed, October, 1927, as compared with September, 1927, and with October, 1926

Cause of death	Rate per 100,000 lives exposed [1]			
	October, 1927	September, 1927	October, 1926	Year 1926
Total, all causes	769.7	801.1	797.7	945.6
Typhoid fever	3.7	5.2	6.3	4.2
Measles	.4	.5	1.3	10.2
Scarlet fever	1.5	1.6	2.1	3.4
Whooping cough	4.1	6.4	6.1	9.6
Diphtheria	9.6	6.6	10.6	9.7
Influenza	6.5	5.2	7.0	31.1
Tuberculosis (all forms)	74.7	80.7	79.3	99.0
Tuberculosis of respiratory system	66.5	70.3	69.9	86.7
Cancer	71.6	72.7	70.7	73.7
Diabetes mellitus	15.0	14.3	11.1	16.7
Cerebral hemorrhage	49.0	49.9	47.1	55.6
Organic diseases of heart	112.0	111.8	108.3	131.3
Pneumonia (all forms)	46.3	37.3	49.4	98.2
Other respiratory diseases	12.6	12.8	11.2	13.0
Diarrhea and enteritis	36.6	47.0	50.0	29.8
Bright's disease (chronic nephritis)	60.5	62.8	63.0	73.5
Puerperal state	12.6	12.5	12.0	15.3
Suicides	7.4	8.0	8.0	7.7
Homicides	6.8	5.3	6.4	7.0
Other external causes (excluding suicides and homicides)	62.1	68.2	58.9	62.3
Traumatism by automobiles	20.3	22.2	19.8	16.8
All other causes	176.4	189.7	185.8	191.0

[1] All figures include infants insured under 1 year of age.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Feeding Garbage to Hogs. F. G. Ashbrook and A. Wilson, U. S. Dept. of Agriculture Farmers' Bulletin No. 1133. 24 pages. (Abstract by Arthur P. Miller.)

This bulletin is prepared from the viewpoint of hog feeding and not of garbage disposal.

Some observations made are of interest, however. (1) Waste food products of more than 8,000,000 people are fed to hogs and fully 40,000,000 pounds of pork are thus produced and sold annually; (2) a ton of municipal garbage may be expected to produce 40 pounds of live weight of hog; (3) garbage used must be reasonably fresh and free from injurious foreign articles; (4) it is better for the city to handle garbage collection and then dispose of garbage to the hog feeder. Long-time contracts with the feeder tend to produce best results.

Street Cleaning and Refuse Disposal in Columbus, Ohio. H. L. Killiam. *Public Works*, vol. 58, No. 9, September, 1927, pp 330-331. (Abstract by E. L. Filby.)

Statistical data as to costs of operation and methods of arriving thereat are given. Flushing thrice weekly gave as good results as daily hand patrol and at reduced cost.

Refuse collection includes garbage and dead animals. Garbage amounted to 20.68 pounds per capita per year. Cost was 10 per cent greater than in 1925. Manure is sold by car and wagon loads.

Garbage disposal by digestion with grease and tankage recovery. From 30,614 tons of garbage, 729 tons of grease, 2,383 tons of tankage, and 8 hides were recovered. Sales averaged $3.596 per ton of green garbage, and operation maintenance charges were $3.155, or gross operating profit $0.441 per ton.

Garbage Collection at Victoria, B. C. F. M. Preston. *Canadian Engineer*, vol. 53, No. 3, July 19, 1927, pp. 141-142. (Abstract by R. E. Thompson.)

All waste material is trucked to a central wharf, where it is dumped into scows and finally disposed of at sea. No charge is made for collection from residences, but all types of business establishments are charged 15 cents per can collected. A standard size can is insisted upon and anything but garden refuse may be placed in it. These cans, having a capacity of 3½ cubic feet, are made at the city's shops and are rented out for the lifetime of the can at $4.20 each. When a can has reached the end of its useful life a printed notice of the fact that it must be renewed is left at the particular house, and when next collection becomes due the old can is removed. During the year 1926 the amount of refuse collected from residential districts was 21,701 cubic yards, and from commercial districts 3,280 cubic yards. The total sum expended during the year was $29,000, of which $5,507 was expended on the contract for towing to sea and dumping.

Paranasal Sinus Infection and Swimming. Frederick E. Hasty, *Journal American Medical Association*, vol. 89, No. 7, August 13, 1927, pp. 507–509. (Abstract by C. H. Kibbey.)

The types of bacteria found in diseases of the paranasal sinuses, middle ear, and upper respiratory tract have received little consideration. These infections have become so frequent that almost every family has suffered as a result of swimming. The author has made a number of interesting tests in the hope of determining some of the important factors entering into the problem.

Attention is called to the fact that most bacteriological examinations of water are made from the standpoint of gastro-enteric infections, and while this is sufficient for drinking water, where water for swimming is being considered the type of bacteria present may be even more important than is the relative number of bacteria it contains.

It is not considered possible completely to sterilize swimming pools. Filtration and the ultra-violet ray are comparatively satisfactory, but chlorine, in one form or another, has proved one of the most satisfactory chemicals. The water used in the author's studies was taken from pools where one of the above methods was employed and he is unable to determine any difference in the results of either method.

The water in a pool during the time of swimming represents the combined washings of the nasal and oral mucous membranes of every swimmer. This fact the author demonstrated in a novel and interesting manner which is conclusive, establishing the fact that water gets well into the nasal chambers of the majority of swimmers, carrying with it contamination from the pool and adding to the pool any organisms washed from the swimmer's nose.

A number of observations were made regarding the effect of water on the mucous membrane adjacent to the ostia of the anterior group of paranasal sinuses, and logical deductions are made regarding the introduction of harmful organisms, together with the possible creation of a favorable environment for their reproduction.

A number of experiments were made with laboratory animals in an effort to produce paranasal sinus infections. A serious obstacle to the use of pigs for this purpose was encountered in the marked dissimilar anatomic structure of these animals as compared to man. An effort was made to overcome structural differences, however, by fixing the animals in such a position that water, once introduced into the antrums, did not readily drain out.

It is of interest that two of the pigs which died, one on the fourth and one on the fifth day, showed *Bacillus coli* and streptococci present in the heart blood on post mortem examination. The control pig continued to thrive.

The author's clinical observations are as follows: (1) The sinus infections resulting from swimming are often severe; (2) children are especially liable to infections; (3) persons who have previously suffered from paranasal infections

or nasal obstructions are liable to acute attacks following swimming; (4) the high percentage of infections is due to virulent organisms reaching vulnerable parts of the nose, etc.

Attention is called to the fact that man is not an aquatic animal and has a lack of adaptability to aquatic life.

Presedimentation of Turbid Water Supplies. A. W. Bull and G. M. Darby. (Trans. Am. Inst. Chem. Eng. 18,365–78 (1927).) From *Chemical Abstracts*, vol. 21, No. 21, Part I, November 10, 1927, p. 3694. (Abstract by Foster D. Snell.)

"Presettling reduced the suspended solids by 85–95 per cent. A three-hour presedimentation reduced the coagulants required to approximately half the amounts for direct treatment. Presedimentation reduces the accumulation of solids in the coagulation basin, reduces the cost of cleaning, and saves the cost of chemical treatment of the water discharged with the sludge from presettling. When water is to be softened there is also a saving in lime. The Dorr clarifier reduces the sludge volume approximately 30 per cent below that obtained by direct sedimentation. Results at seven points on the Mississippi, Missouri, and Arkansas Rivers were about the same. Clarifier and laboratory results at Jefferson City were closely parallel."

San Fernando Chlorination Plant, Los Angeles. Carl Wilson. *Western Construction News*, vol. 2, No. 19, October 10, 1927, pp. 73–75. (Abstract by E. A. Reinke.)

The Los Angeles water department has recently completed an automatic chlorination plant treating a maximum flow of 175,000,000 gallons daily. Wallace and Tiernan vacuum automatic machines, using Pitot tubes instead of Venturi tubes, are employed. Six machines, each of 150-pound daily capacity, are used, four feeding a 72-inch and two feeding a 54-inch trunk. Three electrically-driven Quimby screw pumps are used to supply water to injectors, any one of which will handle normal operation. The pumps come into service automatically as the pressure drops below 125 pounds, and in the event of power interruption an automatically starting Novo 4-cylinder, 25-horsepower gasoline engine operates a Worthington triplex pump of sufficient capacity to supply injector water. Chlorine is purchased in 1-ton drums, handled by overhead cranes, and weighed on 5-ton platform scales which are sensitive to one-half pound. The cost of Mission type, tile-roofed building was $7,500, and of the equipment, $22,000. Thirty samples, representing each subdivision of the Los Angeles water supply, are collected daily, including Sundays and holidays. All samples from San Fernando after chlorination show absence of *B. coli* in 50 cubic centimeters.

How to Increase Ground Water Supplies. W. G. Kirchoffer. *Water Works Engineering*, vol. 80, No. 15, July 20, 1927, pp. 1075 1076. (Abstract by M F. Trice.)

The subject is divided into eight different divisions, in each one of which the method of forming the well and the ground conditions determining its classification are discussed briefly. The flow of water may be increased by a variety of methods, depending on the type of well. Some of the practices mentioned are reaming out with or without recasing; shooting with explosive, increasing the depth; back blowing with air; brushing out; cleaning screens; increasing cavity in loose sand; sinking new cylinder; sinking porous concrete wall. Subsurface dams across valleys are mentioned. Procedure a town should follow in securing new supply is briefly discussed and the increased cost of having inexperienced men do the prospecting is pointed out.

A Study of the Sanitary Significance of Air in Relation to Ice Cream. F. W. Fabian. (Michigan Sta. Tech. Bul. 83 (1927), pp. 30). From Experiment

Station Record, U. S. Dept. of Agriculture, vol. 57, No. 7, November, 1927, pp. 668–69.

"The work reported is divided into two parts:

"I. A study of the bacteria in the air of an ice cream plant, pp. 3–19. Tests were made during each month of the year to determine the number of bacteria in the air in the room where the ice cream was mixed, Pasteurized, homogenized, cooled, and frozen. The fewest bacteria were found during January and the most in April. Weather was the most important factor in determining the number of bacteria present. Other factors were doors and windows, floor, and machinery. Samples indicated that there were more bacteria in the air near the outside walls than near the inside walls, and in the same manner more near the inside walls than in the center of the room.

"The author concludes that bacterial contamination from the air was insignificant. The majority of the bacteria found were peptonizers and alkali—producing the inert bacteria. A few weak acid-forming bacteria were found, but practically no strong acid-forming. Fewer molds than bacteria were present.

"II. A study of the amount of air taken into a freezer during the freezing of ice cream mix, pp. 20–29. In this work the freezer was made air-tight and an apparatus devised whereby the air entering the chamber could be measured. It was found that the amount of air that normally enters a freezer during operation is very small. It was found possible to make ice cream of normal overrun when all openings were made air-tight, and in a few cases where a partial vacuum was established in the freezer a normal overrun was obtained by lengthening the time of whipping somewhat. The author recommends that all openings of the freezer be kept closed during the freezing process, for sanitary reasons."

When is a Milk Bottle Clean? Milton E. Parker. *The Nation's Health*, vol. 9, No. 10, October, 1927, pp. 31–33 and 66. (Abstract by J. H. O'Neill.)

A clean bottle must not only be practically free from bacterial contamination, and especially from harmful types, but should also be equally as free from any physical contamination. Investigations have established a count of 100 bacteria per quart bottle as a reasonable bacterial standard for testing efficiency of milk-bottle sterilization. Units to measure physical cleanliness are not available. Perhaps the best method available at the present time is to wet the surface with distilled water and watch for a break in the film. Freedom from oily or dirty films upon the application of distilled water serves as a reasonable standard of physical cleanliness.

Investigations have shown that colloidal alkalies contribute a combined detergency and antisepsis under practical working conditions superior to that afforded by the usual cleaning methods. The germicidal action of most detergents is due mainly to their degree of hydroxyl iron concentration.

The Disposal of the Sewage of the Sanitary District of Chicago. Division of State Water Survey, Urbana, Ill., Bulletin No. 23, February, 1927. 195 pages. (Abstract by I. W. Mendelsohn.)

This report treats fully of the disposal of the sewage of the Sanitary District of Chicago. There are many tables, charts, and maps which contain data combed from the whole field of sewage disposal. The subject is considered in the following sections: Present disposal of sewage and deficiencies, population and growth, amount and quality of sewage, standard of maximum pollution, required degree of purification with various dilutions, protection of the water supply, savings affected by metering, volume of sewage, future intercepting sewer construction, methods of sewage disposal and practicable efficiencies, sewage disposal costs in other cities, and required works for various diversion flows.

Conclusions: The summarized conclusions include the following: (1) The diversion of the Chicago sewage from Lake Michigan, resulting from the drainage canal

and other causes, has effected a remarkable improvement in the death rate from water-borne diseases. (2) The present discharge of the sewers within the sanitary district is about 800,000,000 gallons per day. This sewage carries an organic load per capita greater than that of any other large city for which accurate figures have been available. (3) In the consideration of sewage-treatment works that will be required under various drafts of dilution water from Lake Michigan, it has been necessary to fix a standard of maximum pollution for the Chicago Drainage Canal in order that reasonable sanitary conditions may be maintained in the Des Plaines and Illinois Rivers. The following is suggested as a reasonable standard: The liquid discharged by the drainage canal, as evidenced by the average of representative samples taken for any 30 consecutive days shall—(*a*) be practically free from settleable solids deposited in two hours; (*b*) contain dissolved oxygen equal to or exceeding the biochemical oxygen demand of said liquid for five days when incubated at 20° C., (*c*) contain not less than three parts per million of dissolved oxygen. (4) Even under the heavy diversions from Lake Michigan in recent years and the generally favorable typhoid death rate, the quality of the water supply for Chicago has been far from satisfactory. Chicago can secure pure clean water at all times by the filtration of its present supply. Filtration is considered as a prerequisite to the adequate disposal of sewage. (5) At the present time 90 per cent of all water services in Chicago are served through so-called "flat rates." Universal metering of the water services is urgent. Metering alone will (*a*) double the average pressure within the city; (*b*) furnish *all* adequate water service where but 25 per cent now enjoy it; (*c*) enable the present water works with but minor extensions to serve the city for the next generation; and (*d*) through the immense savings effected in deferred construction costs enable the city to install filtration works.

If universal metering of the Chicago water works is accomplished within the next 10 years, savings of from $200,000,000 to $225,000,000 will be effected prior to 1945. This amount is so great that, in addition to financing the installation of meters and filtration works for the entire city, it would cover the cost of constructing the entire intercepting sewer and sewage disposal works required in the Chicago Sanitary District up to 1945 and leave a large surplus in addition. (6) The installation of meters on all services will cause the sewage flow of 1945 under complete metering to be less than at the present time. (7) The sanitary district has adopted tunnels for its intercepting sewers. It is believed that a 35-year period (i. e., to 1960) is that for which the design of interceptors should be economically and practically made for sewers constructed in tunnel, capable of duplication in the future without excessive costs. (8) Construction and operating costs of sewage pumping stations and treatment works in the Sanitary District of Chicago in comparison with similar costs in other cities are from two to eight times as great.

Studies on Film Accumulation in the Sprinkling Filter Bed. W. Rudolfs and D. Peterson. Report of the Sewage Substation of the New Jersey Agricultural Experiment Station for year ending June 30, 1926, pp. 498–505. (Abstract by W. M. Olson.)

To learn more about the physical nature of the film upon the stones and the cause of its accumulation and sloughing, this study was made. Conclusions are from weekly determinations of moisture, solid matter, and organic and ash contents of solids. Film one week old was compared with film accumulating from one sloughing period to the next, and with film in the process of sloughing. Data are presented in a table and in four diagrams which would be benefited by more explanation.

Samples of film were scraped from tiles arranged in a cabinet set in the filter bed. Wet film was deposited at an average rate of 3.5 grams per week per tile.

(Tiles 6 by 3 by ⅜ inches—Third Annual Report of the Sewage Substation for the year ending June 30, 1924, p. 50.) The wet weekly film deposit contained 4 per cent solids, of which 18 per cent was ash. A 16 weeks' accumulation of wet film weighed from 15 to 50 grams per tile. The rate of film deposit was not uniform throughout the bed. Opercularia was the dominant protozoan in the film. Nitrification is best shortly after sloughing and decreases with increase in thickness of film. Studies will be made concerning artificial control of film thickness.

Film is built up by organisms utilizing colloidal carbon compounds in the applied liquid, by carbonates and sulphates absorbed from solution, by ash deposited in oxidation, and by excreta of large organisms.

The seasonal slough may be due to the weight of old film, the seasonal succession of fungi and the favorable habitat for large metazoan animals in the old film.

"The design of a filter bed should depend on the amounts of solids to be handled." At Plainfield, with 75 p. p. m. suspended solids, the beds must be at least 6 feet deep.

The Treatment of Beet Flume and Washer Waters. Paul Hirshfelder. *Centr. Zuckerind.* 35, 273–4 (1927). From *Chemical Abstracts*, vol. 21, No. 22, Part I, November 20, 1927, p. 3997. (Abstract by W. L. Badger.)

"Such waters may be treated by (*A*) simple settling basins. The first cost is small, but the cost of sludge disposal is heavy, and trouble is experienced because of putrefaction in the sludge. (*B*) The waste water may be pumped into fields, which are used for cultivation after a layer of sludge has built up. This involves heavy charges for land, and the results are not satisfactory, because of the settling of sand in the nearer areas. (*C*) Small settling basins with continuous sludge removal may be used, and the heavy sludge formed pumped to waste land. This is often satisfactory, especially where the sludge need not be pumped far. (*D*) Where sludge must be transported over 2 kilometers, a settling basin with a slow-moving rake should be used to produce a sludge of not over 10–15 per cent solids. This may be pumped without undue expense and without danger of sand settling out."

South Australian Waterworks and Sewerage Systems. Herbert E. Bellamy. *Journal Royal Sanitary Institute*, vol. 57, No. 9, March, 1927, pp. 583–587. (Abstract by A. H. Fletcher.)

The author describes the waterworks for the city of Adelaide, the capital of South Australia, which consists of four reservoirs of a combined capacity of 7,748 million gallons. The rainfall on 305 square miles of catchment area is utilized and supplies a population of 230,000. The Metropolitan District covers an area of 175 square miles. The length of mains is 1,108½ miles.

Country water districts have been formed. The principal country districts are the Beetaloo, Barossa, Warren, Bundaleer, and Tod River, in which 82 towns, as well as country lands, are supplied. There are 2,740½ miles of cast-iron mains supplying these districts.

In the year 1878 an act of Parliament was passed making provision for the necessary expenditure to construct a complete sewerage system for Adelaide. This was the first city in Australia for which a complete sewerage system combined with a sewage farm for the disposal of the sewage was adopted. It is now proposed to abandon the farm and to construct treatment works of the activated sludge system.

Relation of Regional Plan Work to Public Health Engineering. Howard E. Long. *American Journal of Public Health*, vol. 17, No. 10, October, 1927, pp. 1014–1017. (Abstract by H. N. Old.)

Attention is directed in this article to the cooperation which should exist between sanitary engineers and those engaged in regional planning, the goal of

both groups being that of providing adequate and unadulterated air, light, food and water with proper disposal and elimination of waste products on a community basis with due consideration of the economics of the problem.

The regional planner is concerned more particularly in planning and developing adequate present and future means of accomplishing facility of supply, as well as purity of supply, while the public-health engineer is responsible for the operation and maintenance of the facilities afforded.

While it is stated that some interests of the public-health worker are beyond the scope of the planner, the "health engineer and the planning engineer meet on common ground and should cooperate to the fullest possible extent in subjects wherein community of interest and regional attention to futures are indicated. For example, in the field of sewage disposal, food and water supply, air and light, housing and zoning, recreation, hospital and convalescent facilities, and education, the work of the planner augments that of the sanitarian, and vice versa."

Under the subtitles sewerage, water supply, food supply, hazards to health, modern era one of tremendous nervous strain, recreation and quiet, schools, and burial places, the author elaborates somewhat on specific conditions upon which these two groups of public-service engineers should more or less dovetail their efforts.

Particular stress is placed by the author upon the advantages of central heating systems in communities where this plan is feasible, a project which has received too little attention up to this time on the part of sanitarians and regional planners.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 8, 1927, and January 7, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 8, 1927, and January 7, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928
New England States:								
Maine	3	6	24		202	36	0	0
New Hampshire								
Vermont	2	2			90	1	0	0
Massachusetts	131	105	15	20	176	1,082	2	3
Rhode Island		19				8		0
Connecticut	34	44	12	7	26	71	1	0
Middle Atlantic States:								
New York	328	355	[1] 62	[1] 33	1,105	882	7	5
New Jersey	151	149	23	11	27	141	2	1
Pennsylvania	231	272			795	683	1	6
East North Central States								
Ohio		141		21		166		4
Indiana	92	56	79	49	186	43	0	0
Illinois	179	190	47	34	1,444	38	4	12
Michigan	112	61		4	109	265	0	2
Wisconsin	42	42	38	68	818	45	3	2
West North Central States								
Minnesota	55	25			147	8	1	3
Iowa [2]	54	14			228	4	1	1
Missouri	58	[3] 42	51	[3] 4	247	[3] 43	1	[3] 0
North Dakota	7				151		0	
South Dakota	9		2	7	102	39	0	0
Nebraska	6	9	1		74	22	0	2
Kansas	21	13	12	2	165	15	3	1
South Atlantic States:								
Delaware	1	3			1	20	0	0
Maryland [2]	65	33	61	36	34	175	1	0
District of Columbia	20		2		2		0	
Virginia								
West Virginia	27	12	44	34	86	57	0	0
North Carolina	64	49			161	1,475	0	0
South Carolina	34	45	779	1,314	83	731	0	0
Georgia	31	11	101	173	54	34	0	0
Florida	42	15	1	4	15	3	2	0

[1] New York City only. [2] Week ended Friday. [3] Exclusive of Kansas City.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 8, 1927, and January 7, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928
East South Central States:								
Kentucky		12		19		79		0
Tennessee	25	21	57	119	98	578	0	1
Alabama	52	43	74	183	34	97	1	2
Mississippi	37	25					1	
West South Central States:								
Arkansas	7	11	100	111	1	76	0	1
Louisiana	27	41	27	62		39	1	2
Oklahoma [4]	34	39	265	135	23	114	0	1
Texas	52	112	42	142	11	67	0	0
Mountain States:								
Montana	7	1	1		60	1	1	3
Idaho	2				61		0	1
Wyoming	0		9		79	2	1	10
Colorado	12	28	1	1	44	85	0	4
New Mexico	4	2			15	62	0	0
Arizona	4	16			10	8	0	2
Utah [2]	3	3		5	688	2	0	1
Nevada								
Pacific States:								
Washington	29	18			392	230	7	2
Oregon	30	11	30	22	44	46	1	1
California	178	125	37	33	1,115	74	5	5

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928
New England States:								
Maine	1	0	34	21	0	0	0	3
New Hampshire								
Vermont	0	0	16	2	0	0	0	0
Massachusetts	2	6	515	294	0	0	12	8
Rhode Island		0		42		0		0
Connecticut	0	0	93	78	0	26	3	1
Middle Atlantic States:								
New York	6	9	625	583	7	4	46	23
New Jersey	1	3	285	162	0	3	6	6
Pennsylvania	0	0	566	445	0	1	34	24
East North Central States:								
Ohio		1		397		19		25
Indiana	1	1	255	127	180	133	4	9
Illinois	1	2	384	293	43	30	21	4
Michigan	0	2	332	162	41	17	7	3
Wisconsin	0	1	182	172	13	27	7	6
West North Central States:								
Minnesota	0	0	256	153	4	2	6	5
Iowa [2]	0	2	59	55	5	58	0	6
Missouri	0	[3] 1	101	[3] 68	4	[3] 38	7	[3] 5
North Dakota	0		88		10		1	
South Dakota	1	0	18	32	6	6	8	0
Nebraska	1	1	51	63	46	12	4	1
Kansas	0	0	201	135	29	73	6	1
South Atlantic States:								
Delaware	0	0	39	1	0	0	0	1
Maryland [2]	0	1	52	49	0	0	4	5
District of Columbia	0		28		0		0	
Virginia								
West Virginia	0	1	38	46	2	11	6	6
North Carolina	0	0	78	36	77	63	8	3
South Carolina	2	1	11	19	9	19	18	0
Georgia	0	1	31	12	61	0	4	5
Florida	0	0	19	9	37	1	4	10

[2] Week ended Friday. [3] Exclusive of Kansas City. [4] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 8, 1927, and January 7, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928	Week ended Jan. 8, 1927	Week ended Jan. 7, 1928
East South Central States:								
Kentucky		0		78		16		14
Tennessee	0	1	71	17	6	5	26	5
Alabama	0	0	20	10	27	1	8	5
Mississippi	0	0	21	23	9	1	10	4
West South Central States:								
Arkansas	0	0	13	5	6	7	7	2
Louisiana	0	0	14	13	7	10	15	7
Oklahoma [4]	0	0	36	45	10	108	9	23
Texas	0	3	50	119	9	29	9	6
Mountain States:								
Montana	0	1	138	27	5	36		1
Idaho	0	0	35	4	3	4	1	3
Wyoming	0	0	36	28	0	5	1	1
Colorado	0	4	47	106	3	31	3	5
New Mexico	1	0	23	22	1	1	2	3
Arizona	0	0	9	8	0	0	0	3
Utah [2]	0	0	13	10	4	19	0	1
Nevada								
Pacific States:								
Washington	1	4	172	55	81	31	8	2
Oregon	0	6	54	13	34	32	3	3
California	2	9	220	159	20	18	24	6

[2] Week ended Friday. [4] Exclusive of Tulsa.

Reports for Week Ended December 31, 1927

DIPHTHERIA

	Cases
District of Columbia	13
North Carolina	66
North Dakota	1

INFLUENZA

District of Columbia	4

MEASLES

District of Columbia	4
North Carolina	1,617

MENINGOCOCCUS MENINGITIS

North Carolina	1
North Dakota	1

SCARLET FEVER

	Cases
District of Columbia	33
North Carolina	64
North Dakota	20

SMALLPOX

North Carolina	57
North Dakota	1

TYPHOID FEVER

North Carolina	1

Reports for Week Ended December 24, 1927

DIPHTHERIA

	Cases
North Carolina	64
North Dakota	6

MEASLES

North Carolina	1,151
North Dakota	5

MENINGOCOCCUS MENINGITIS

North Carolina	1

POLIOMYELITIS

	Cases
North Carolina	1
North Dakota	1

SCARLET FEVER

North Carolina	43
North Dakota	53

SMALLPOX

North Carolina	65

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

Delaware	0	3			33		0	9	0	8
Indiana	0	226	35		51		69	396	20	103
November, 1927										
Arkansas	1	171	313	731	89	185	11	88	11	82
Delaware	0	12	4	1	42		2	15	0	4
District of Columbia	0	92	5		4		0	109	2	9
Florida	5	161	24	30	6	2	5	17	8	17
Montana	4	11	10		2		6	100	109	4
Rhode Island	1	123	31		9		12	122	1	5
Virginia	5	564	1,753	67	654	21	13	404	24	94

October, 1927

	Cases
Chicken pox:	
Delaware	3
Indiana	102
Mumps:	
Delaware	11
Indiana	3
Whooping cough:	
Delaware	6
Indiana	64

November, 1927

	Cases
Chicken pox:	
Arkansas	136
Delaware	8
District of Columbia	63
Florida	14
Montana	167
Rhode Island	31
Virginia	632
Dysentery:	
Florida	1
Virginia	68
German measles:	
Montana	2
Rhode Island	1
Hookworm disease:	
Florida	162
Virginia	10
Lethargic encephalitis:	
District of Columbia	1
Florida	1
Montana	1
Mumps:	
Arkansas	22
Delaware	35
Florida	23
Montana	1
Rhode Island	90
Ophthalmia neonatorum:	
Arkansas	5
Rhode Island	5
Paratyphoid fever:	
Florida	1
Septic sore throat:	
Montana	1
Rhode Island	1
Tetanus:	
Florida	10
Rhode Island	2
Trachoma:	
Arkansas	32
Typhus fever:	
Florida	1
Whooping cough:	
Arkansas	62
Delaware	11
District of Columbia	20
Florida	5
Montana	28
Rhode Island	12
Virginia	369

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 98 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,390,000. The estimated population of the 92 cities reporting deaths is more than 29,720,000. The estimated expect-

ancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended December 24, 1927, and December 25, 1926

	1927	1926	Estimated expectancy
Cases reported			
Diphtheria:			
41 States	2,017	1,574	
98 cities	1,190	940	1,183
Measles:			
40 States	2,906	4,014	
98 cities	1,693	1,209	
Poliomyelitis:			
41 States	82	12	
Scarlet fever:			
41 States	2,987	3,168	
98 cities	1,099	1,457	1,166
Smallpox:			
41 States	526	573	
98 cities	92	83	66
Typhoid fever:			
41 States	260	286	
98 cities	61	60	43
Deaths reported			
Influenza and pneumonia:			
92 cities	865	850	
Smallpox:			
92 cities	0	0	

City reports for week ended December 24, 1927

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1918 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	75,333	5	2	1	0	0			
New Hampshire:									
Concord	22,546	0	0	0	0	0	0		2
Nashua	29,723	0	0	0	0	0	0		0
Vermont:									
Barre	10,008	3	0	0	0	0	0		0
Burlington	24,089	1	0	0	0	0	0		0
Massachusetts:									
Boston	779,620	66	59	21	3	1	197		27
Fall River	128,993	1	5	5	1	0	1		1
Springfield	142,065	2	4	12	0	0	0		1
Worcester	190,757	9	5	6	0	0	1		1

City reports for week ended December 24, 1927—Continued

Division, State, and city	Population, July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
NEW ENGLAND—con.									
Rhode Island:									
Pawtucket	69,760	2	2	2	0	0	0	0	0
Providence	267,918	0	10	23	0	0	8	6	3
Connecticut:									
Bridgeport	(1)	1	9	2	3	1	1	0	5
Hartford	160,197	7	8	9	0	0	0	1	5
New Haven	178,927	4	4	2	1	0	22	10	4
MIDDLE ATLANTIC									
New York:									
Buffalo	538,016	40	24	28	-------	0	135	28	17
New York	5,873,356	109	198	279	21	13	56	0	146
Rochester	316,786	5	11	13	-------	0	4	5	8
Syracuse	182,003	23	7	1	-------	0	28	4	4
New Jersey:									
Camden	128,642	3	5	9	0	0	0	1	4
Newark	452,513	24	16	26	5	0	38	20	9
Trenton	132,020	0	6	2	0	1	6	2	5
Pennsylvania:									
Philadelphia	1,979,364	91	83	41	-------	5	18	58	45
Pittsburgh	631,563	32	24	69	-------	4	223	38	17
Reading	112,707	24	5	4	-------	0	0	0	2
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	409,333	13	16	9	0	6	50	0	12
Cleveland	936,485	56	44	87	1	2	15	105	13
Columbus	279,836	6	7	9	1	1	1	4	5
Toledo	287,380	67	15	11	1	1	31	9	9
Indiana:									
Fort Wayne	97,846	0	5	6	0	0	1	0	1
Indianapolis	358,819	11	13	6	0	2	1	19	8
South Bend	80,091	3	1	0	0	0	0	0	1
Terre Haute	71,071	0	2	0	0	0	0	0	2
Illinois:									
Chicago	2,995,239	77	114	135	2	3	12	25	64
Springfield	63,923	11	2	0	1	1	0	0	0
Michigan:									
Detroit	1,245,824	72	76	39	1	2	133	28	22
Flint	130,316	7	11	5	0	0	1	19	7
Grand Rapids	153,698	6	5	0	1	1	19	5	5
Wisconsin:									
Kenosha	50,891	22	1	2	0	0	0	7	0
Milwaukee	509,192	76	26	18	2	2	2	12	14
Racine	67,707	2	3	2	0	0	0	0	2
Superior	39,671	11	1	0	0	0	0	0	2
WEST NORTH CENTRAL									
Minnesota:									
Duluth	110,502	4	2	0	0	0	0	0	1
Minneapolis	425,435	64	22	10	0	0	1	5	12
St. Paul	246,001	7	18	1	0	3	0	20	12
Iowa:									
Davenport	52,469	0	1	0	0	-------	1	0	-------
Des Moines	141,441	0	5	1	0	-------	0	0	2
Sioux City	76,411	5	3	0	0	-------	2	2	-------
Waterloo	36,771	6	0	0	0	-------	0	0	-------
Missouri:									
Kansas City	367,481	70	12	5	0	2	0	79	7
St. Joseph	78,342	5	3	0	0	0	2	0	4
St. Louis	821,543	28	51	35	0	0	14	10	-------
North Dakota:									
Fargo	26,403	19	1	0	0	0	0	0	1
Grand Forks	14,811	14	1	0	0	-------	1	0	-------
South Dakota:									
Aberdeen	15,036	5	0	0	0	-------	0	0	-------
Sioux Falls	30,127	0	0	0	0	-------	0	0	-------
Nebraska:									
Lincoln	60,941	25	1	1	0	0	1	11	0
Omaha	211,768	10	5	5	0	0	0	0	5
Kansas:									
Topeka	55,411	11	2	6	1	0	0	0	2
Wichita	88,367	9	6	0	0	0	0	0	3

[1] No estimate made.

City reports for week ended December 24, 1927—Continued

Division, State, and city	Population, July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
SOUTH ATLANTIC									
Delaware:									
Wilmington	122,049	0	2	2	0	0	0	3	0
Maryland:									
Baltimore	796,296	78	36	19	7	2	84	3	38
Cumberland	33,741	0	2	0	0	0	0	0	2
Frederick	12,035	0	0	1	0	0	0	0	0
District of Columbia:									
Washington	497,906	24	20	12	1	1	2	0	15
Virginia:									
Lynchburg	30,395	4	2	6	0	0	1	0	0
Norfolk	(1)	9	3	3	0	0	0	0	6
Richmond	186,403	5	9	10	0	0	16	0	8
Roanoke	58,208	10	3	3	0	1	1	4	0
West Virginia:									
Charleston	49,019	1	2	1	0	2	0	0	2
Wheeling	56,208	12	2	0	0	0	0	0	1
North Carolina:									
Raleigh	30,371	9	1	1	0	0	1	0	1
Wilmington	37,061	5	0	5	0	0	174	0	2
Winston-Salem	69,031	3	2	3	0	0	9	5	3
South Carolina:									
Charleston	73,125	0	2	3	9	1	1	0	3
Columbia	41,225	18	1	3	0	------	67	23	3
Greenville	27,311	0	1	0	0	0	57	2	1
Georgia:									
Atlanta	(1)	7	5	1	38	4	0	3	13
Brunswick	16,809	0	0	0	0	0	0	1	1
Savannah	93,134	1	2	4	8	0	27	0	4
Florida:									
St. Petersburg	26,847	------	0	------	------	0	------	------	1
Tampa	94,743	2	1	2	0	0	0	0	1
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,309	0	2	0	0	0	0	0	1
Lexington	46,895	2	------	0	0	0	2	0	1
Louisville	305,935	------	0	------	------	------	------	------	------
Tennessee:									
Memphis	174,533	5	6	14	0	1	123	21	6
Nashville	136,220	5	3	1	0	2	2	3	14
Alabama:									
Birmingham	205,670	9	5	5	16	4	15	3	9
Mobile	65,955	0	1	3	3	1	0	0	3
Montgomery	46,481	0	1	1	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	31,643	0	2	3	0	------	0	0	------
Little Rock	74,216	0	1	2	1	2	2	0	2
Louisiana:									
New Orleans	414,493	1	11	15	16	11	0	0	18
Shreveport	57,857	3	2	2	0	1	10	0	2
Oklahoma:									
Oklahoma City	(1)	6	2	4	7	0	0	1	7
Texas:									
Dallas	194,450	12	13	27	1	2	0	0	4
Galveston	48,375	0	1	2	0	0	0	0	2
Houston	164,954	6	5	27	0	0	1	2	8
San Antonio	198,069	2	3	4	0	1	7	1	18
MOUNTAIN									
Montana:									
Billings	17,971	0	0	0	0	0	0	0	0
Great Falls	20,883	0	1	1	0	0	0	0	1
Helena	12,037	1	0	0	0	0	0	0	1
Missoula	12,668	0	1	0	0	0	0	0	0
Idaho:									
Boise	23,042	0	0	0	0	0	0	2	0

[1] No estimate made.

City reports for week ended December 24, 1927—Continued

Division, State, and city	Population, July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MOUNTAIN—continued									
Colorado:									
Denver	280,911	38	12	6		3	1	17	17
Pueblo	43,787	22	3	0	0	0	0	0	2
New Mexico:									
Albuquerque	21,000	2	0	0	0	0	12	0	1
Utah:									
Salt Lake City	130,948	18	3	6	0	0	1	0	6
Nevada:									
Reno	12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(1)	15	7	0	0		81	7	
Spokane	108,897	9	4	2	0		1	0	
Tacoma	104,455	2	3	1	0	0	4	2	6
Oregon:									
Portland	282,383	34	11	8	0	1	2	2	3
California:									
Los Angeles	(1)	26	42	39	7	4	3	13	31
Sacramento	72,260	4	2	0	0	0	2	1	2
San Francisco	557,530	38	19	18	5	3	7	23	9

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	2	1	0	0	0	0	0	1	0	0	23
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	12
Nashua	0	0	0	0	0	0	0	0	0	0	4
Vermont:											
Barre	1	0	0	0	0	0	0	0	0	0	1
Burlington	1	0	0	0	0	0	0	0	0	1	4
Massachusetts:											
Boston	54	59	0	0	0	9	1	1	0	46	203
Fall River	3	6	0	0	0	4	0	1	0	1	19
Springfield	7	7	0	0	0	0	0	0	0	12	33
Worcester	12	4	0	0	0	3	0	0	0	1	50
Rhode Island:											
Pawtucket	1	1	0	0	0	2	0	0	0	0	26
Providence	7	31	0	0	0	3	0	1	0	1	74
Connecticut:											
Bridgeport	9	2	0	0	0	4	0	0	0	2	38
Hartford	8	7	0	0	0	2	0	0	0	10	49
New Haven	9	3	0	0	0	1	0	0	0	33	43
MIDDLE ATLANTIC											
New York:											
Buffalo	24	44	0	0	0	6	1	0	0	15	134
New York	187	167	0	0	0	79	12	9	1	159	1,341
Rochester	13	8	0	0	0	2	0	0	0	12	94
Syracuse	12	14	0	0	0	2	0	7	0	23	62
New Jersey:											
Camden	5	2	0	0	0	1	0	0	0	0	32
Newark	19	17	0	0	0	6	1	1	0	37	94
Trenton	3	2	0	0	0	4	0	0	0	0	42
Pennsylvania:											
Philadelphia	75	67	0	0	0	25	4	2	0	34	491
Pittsburgh	35	17	0	0	0	9	1	1	0	21	179
Reading	1	13	0	0	0	2	0	0	0	1	22

[1] No estimate made.

City reports for week ended December 24, 1927—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	15	9	1	1	0	7	0	1	0	0	151
Cleveland	35	17	1	0	0	13	2	2	0	30	198
Columbus	14	11	1	0	0	2	0	0	0	0	84
Toledo	13	10	1	0	0	10	0	1	0	2	81
Indiana:											
Fort Wayne	3	2	0	0	0	0	0	0	0	0	16
Indianapolis	10	8	6	3	0	2	0	1	0	0	109
South Bend	4	0	1	0	0	0	0	0	0	1	16
Terre Haute	3	0	0	4	0	5	0	0	0	0	16
Illinois:											
Chicago	115	106	1	4	0	56	5	2	0	77	735
Springfield	2	8	0	0	0	0	0	0	0	1	18
Michigan:											
Detroit	90	82	2	2	0	17	2	2	0	50	26
Flint	8	20	1	0	0	2	0	1	0	12	29
Grand Rapids	11	5	1	0	0	0	0	3	0	1	25
Wisconsin:											
Kenosha	2	3	0	4	0	0	0	0	0	1	6
Milwaukee	23	36	2	0	0	8	0	0	0	11	116
Racine	6	6	1	0	0	0	0	0	0	3	9
Superior	2	5	1	0	0	0	0	0	0	0	6
WEST NORTH CENTRAL											
Minnesota:											
Duluth	9	1	1	0	0	0	1	0	0	1	22
Minneapolis	51	33	7	1	0	0	0	1	0	1	73
St. Paul	27	6	5	0	0	3	0	0	0	0	59
Iowa:											
Davenport	1	4	1	0	--------	--------	0	1	--------	0	--------
Des Moines	6	11	1	13	--------	2	0	0	0	0	33
Sioux City	2	1	0	0	--------	--------	0	0	--------	4	--------
Waterloo	2	1	0	0	--------	--------	0	0	--------	0	--------
Missouri:											
Kansas City	12	16	1	0	0	9	0	0	0	5	101
St. Joseph	2	6	0	23	0	1	0	0	0	0	31
St. Louis	38	24	1	0	0	8	2	3	0	12	209
North Dakota:											
Fargo	2	0	0	0	0	1	0	0	0	2	12
Grand Forks	0	0	0	0	--------	--------	0	0	--------	0	--------
South Dakota:											
Aberdeen	1	0	0	0	--------	--------	0	0	--------	0	--------
Sioux Falls	2	3	0	0	--------	--------	0	0	--------	0	4
Nebraska:											
Lincoln	2	1	0	0	0	0	0	0	0	3	16
Omaha	6	6	4	0	0	1	0	0	0	0	45
Kansas:											
Topeka	2	3	0	0	0	0	0	0	0	9	13
Wichita	4	5	0	15	0	2	0	0	0	1	38
SOUTH ATLANTIC											
Delaware:											
Wilmington	4	2	0	0	0	1	0	0	0	0	31
Maryland:											
Baltimore	27	11	0	0	0	10	3	2	1	23	227
Cumberland	1	1	0	0	0	0	0	1	0	0	6
Frederick	0	0	0	0	0	0	0	0	0	0	4
Dist. of Columbia:											
Washington	22	27	0	0	0	8	2	0	0	7	129
Virginia:											
Lynchburg	0	3	0	0	0	2	0	0	0	0	9
Norfolk	2	1	0	0	0	5	0	1	0	0	--------
Richmond	6	8	0	0	0	2	1	1	0	0	58
Roanoke	1	4	0	0	0	0	0	0	0	0	18
West Virginia:											
Charleston	1	4	0	0	0	1	0	1	1	0	34
Wheeling	2	6	0	0	0	3	0	0	0	0	18
North Carolina:											
Raleigh	0	0	0	0	0	1	0	0	0	0	8
Wilmington	0	2	0	1	0	0	0	0	0	0	17
Winston-Salem	2	1	0	0	0	2	0	0	0	1	--------

City reports for week ended December 24, 1927—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
South Carolina:											
Charleston	0	0	0	0	0	3	0	1	0	0	32
Columbia	0	0	1	0		1	0	0		0	11
Greenville	0	0	0	1	0	0	0	0	0	0	7
Georgia:											
Atlanta	4	6	1	0	0	6	0	0	1	0	92
Brunswick	0	0	0	0	0	0	0	0	0	0	7
Savannah	1	1	1	9	0	3	0	2	0	0	32
Florida:											
St. Petersburg	0		0		0	0	0		0		17
Tampa	1	3	0	0	0	2	0	0	0	0	25
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	0	0	0	0	2	0	0	0	0	20
Lexington		0		0	0	1		0	0	0	17
Louisville	6		0				1				
Tennessee:											
Memphis	5	5	0	1	0	2	0	1	0	0	80
Nashville	3	0	0	0	0	0	0	0	0	0	48
Alabama:											
Birmingham	4	5	1	3	0	5	0	3	0	3	66
Mobile	1	3	0	0	0	2	0	0	0	0	20
Montgomery	0	1	1	0	0	0	0	0	0	5	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	0	0	0			0	2		0	
Little Rock	2	1	0	0	0	1	0	0	0	0	
Louisiana:											
New Orleans	6	1	0	0	0	13	2	1	0	3	168
Shreveport	1	4	0	0	0	2	0	0	0	1	31
Oklahoma:											
Oklahoma City	3	2	0	9	0	0	0	0	0	0	23
Texas:											
Dallas	3	4	1	3	0	2	0	1	0	1	55
Galveston	0	4	0	0	0	1	0	0	0	0	16
Houston	3	4	1	0	0	8	0	0	2	0	87
San Antonio	1	4	0	0	0	9	0	0	0	0	58
MOUNTAIN											
Montana:											
Billings	2	0	1	1	0	0	0	0	0	1	3
Great Falls	1	1	0	0	0	0	0	0	0	3	10
Helena	1	1	0	0	0	0	0	0	0	0	5
Missoula	0	1	0	0	0	0	0	0	0	0	11
Idaho:											
Boise	0	1	1	0	0	0	0	0	0	0	3
Colorado:											
Denver	12	11	1	0	0	14	0	1	0	1	97
Pueblo	2	3	0	8	0	2	0	0	0	0	10
New Mexico:											
Albuquerque	0	0	0	0	0	1	0	0	0	0	11
Utah:											
Salt Lake City	2	1	1	1	0	4	0	0	0	1	34
Nevada:											
Reno	1	0	0	1	0	0	0	0	0	0	0
PACIFIC											
Washington:											
Seattle	8	6	2	0			0	0		5	
Spokane	6	6	4	6			0	0		0	
Tacoma	3	2	5	0	0	2	0	0	0	0	27
Oregon:											
Portland	8	8	5	8	0	3	0	1	0	1	59
California:											
Los Angeles	24	32	4	0	0	22	2	2	0	12	
Sacramento	2	8	1	1	0	1	0	2	1	0	18
San Francisco	12	19	1	3	0	12	1	0	0	4	178

City reports for week ended December 24, 1927—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	1	0	0	0	0	4	0
Fall River	0	0	0	0	0	0	0	1	0
MIDDLE ATLANTIC									
New York:									
New York	3	4	3	2	0	0	1	3	0
Syracuse	1	0	0	0	0	0	0	0	0
New Jersey:									
Newark	3	0	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	1	1	0	0	0	0	0	0	0
Pittsburgh	1	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	1	0	0	0	0	0	0	0	0
Columbus	0	0	1	1	0	0	0	0	0
Indiana:									
Indianapolis	0	2	0	0	0	0	0	0	0
Terre Haute	0	0	0	0	0	0	0	1	0
Illinois:									
Chicago	6	1	1	0	1	1	0	1	1
Michigan:									
Detroit	1	0	1	0	0	0	0	1	0
Wisconsin:									
Milwaukee	1	1	1	1	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	0	0	1	0	0	0	0	1	0
Iowa:									
Des Moines	0		0		0		0	1	
Missouri:									
St. Louis	2	0	0	0	0	0	0	0	0
North Dakota:									
Fargo	1	0	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	1	0	0	0	0	0	0
Virginia:									
Norfolk	0	0	0	0	0	0	0	1	0
South Carolina:									
Columbia	0	0	0	0	0	1	0	0	0
Georgia:									
Atlanta	1	0	0	0	0	0	0	0	0
Savannah [1]	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	0	0	1	0	0	0
Alabama:									
Birmingham	0	0	0	0	1	0	0	0	0
Mobile	0	0	0	0	0	1	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	1	0	0	0	0	0	0
Texas:									
Dallas	0	0	0	0	1	0	0	1	0
Galveston	1	1	0	0	0	0	0	0	0
Houston	0	0	0	0	0	2	0	2	0

[1] Typhus fever: 3 cases at Savannah, Ga.

City reports for week ended December 24, 1927—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
MOUNTAIN									
Montana:									
Great Falls	1	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Tacoma	0	0	0	0	0	0	0	4	2
Oregon:									
Portland	1	0	0	0	0	0	0	3	0
California:									
Los Angeles	0	0	0	0	0	0	0	1	0
San Francisco	0	0	0	2	0	0	0	1	0

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended December 24, 1927, compared with those for a like period ended December 25, 1926. The population figures used in computing the rates are approximate estimates as of July 1, 1926 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 30,445,000 in 1926 and 30,966,000 in 1927. The 95 cities reporting deaths had nearly 29,785,000 estimated population in 1926 and nearly 30,296,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, November 20 to December 24, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927
101 cities	212	204	224	233	201	204	188	[2] 206	[3] 163	[2] 203
New England	132	169	172	267	163	216	160	200	160	193
Middle Atlantic	155	213	177	252	161	228	167	226	140	233
East North Central	258	220	266	220	223	228	213	248	[4] 182	212
West North Central	192	179	210	179	194	129	129	129	113	123
South Atlantic	281	196	240	225	237	190	216	140	[5] 214	143
East South Central	217	122	300	168	284	71	145	[2] 162	150	[2] 177
West South Central	301	306	318	273	266	218	258	218	168	344
Mountain	201	171	228	144	240	144	164	162	137	117
Pacific	303	162	268	259	238	168	252	168	225	157

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1926 and 1927, respectively.
[2] Louisville, Ky., not included.
[3] Terre Haute, Ind., and Norfolk, Va., not included.
[4] Terre Haute, Ind., not included.
[5] Norfolk, Va., not included.

Summary of weekly reports from cities, November 20 to December 24, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926—Continued

MEASLES CASE RATES

	Week ended—									
	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927
101 cities	134	137	177	189	197	225	193	[2] 249	[3] 209	[2] 288
New England	57	499	101	539	165	539	229	604	107	536
Middle Atlantic	30	129	37	180	23	199	24	206	22	251
East North Central	135	60	151	122	212	140	256	117	[4] 249	157
West North Central	109	24	113	24	129	50	109	46	77	38
South Atlantic	22	201	48	308	54	527	89	607	[5] 62	797
East South Central	16	163	26	224	78	307	21	[2] 737	31	[2] 1,032
West South Central	103	88	142	122	146	134	82	252	103	84
Mountain	2,543	27	2,844	27	3,217	36	2,351	27	2,780	18
Pacific	338	175	699	228	613	178	603	238	879	257

SCARLET FEVER CASE RATES

	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927
101 cities	213	159	242	184	238	184	279	[2] 212	[3] 253	[2] 187
New England	285	181	325	276	340	320	387	325	248	281
Middle Atlantic	138	122	157	155	178	156	214	199	212	173
East North Central	196	196	237	192	235	216	241	243	[4] 255	212
West North Central	411	204	436	250	[illegible]	206	413	204	371	202
South Atlantic	156	172	181	174	[illegible]	134	199	163	[5] 171	145
East South Central	238	87	243	148	150	82	248	[2] 147	243	[2] 103
West South Central	198	168	210	143	142	117	236	172	125	92
Mountain	784	180	930	360	802	306	1,112	243	975	171
Pacific	249	131	265	128	230	152	383	154	303	191

SMALLPOX CASE RATES

	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927
101 cities	5	22	14	17	11	13	16	[2] 19	[3] 14	[2] 16
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	1	0	1	0	0	0
East North Central	7	1	21	10	7	4	11	17	[4] 16	12
West North Central	30	202	48	115	38	75	46	115	28	77
South Atlantic	4	2	19	5	19	7	26	5	[5] 30	20
East South Central	5	0	0	10	21	5	78	[2] 7	36	[2] 29
West South Central	4	4	9	8	9	8	43	0	26	13
Mountain	0	54	18	45	18	99	0	117	18	99
Pacific	5	45	35	39	43	39	40	31	43	26

TYPHOID FEVER CASE RATES

	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927
101 cities	12	10	10	9	13	11	12	[2] 8	[3] 10	[2] 11
New England	7	14	7	7	2	12	31	0	40	9
Middle Atlantic	13	10	9	10	18	8	8	8	5	10
East North Central	3	6	6	5	3	9	5	3	[4] 3	8
West North Central	8	14	10	12	4	14	10	6	10	8
South Atlantic	19	9	17	16	21	9	19	9	[5] 16	16
East South Central	31	15	41	15	41	31	21	[2] 29	16	[2] 29
West South Central	17	13	9	21	13	21	21	17	17	17
Mountain	18	27	9	9	9	9	9	18	0	9
Pacific	21	5	16	5	16	13	24	18	21	10

[2] Louisville, Ky., not included.
[3] Terre Haute, Ind., and Norfolk, Va., not included.
[4] Terre Haute, Ind., not included.
[5] Norfolk, Va., not included.

Summary of weekly reports from cities, November 20 to December 24, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926 —Continued

INFLUENZA DEATH RATES

	Week ended—									
	Nov. 27, 1926	Nov. 26, 1927	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927
95 cities	10	[6] 11	14	12	17	12	14	[2] 14	[3] 15	[2] 17
New England	9	2	7	5	9	9	7	12	7	5
Middle Atlantic	7	10	13	11	12	7	13	9	14	11
East North Central	9	5	9	9	14	9	12	11	[4] 10	13
West North Central	2	6	4	4	15	6	15	6	11	10
South Atlantic	15	13	21	13	34	17	26	15	[5] 34	20
East South Central	41	46	41	46	41	56	5	[2] 88	36	[2] 59
West South Central	31	34	40	43	40	47	40	56	18	73
Mountain	36	18	46	27	36	9	9	9	27	27
Pacific	0	[6] 14	11	14	11	3	7	17	4	24

PNEUMONIA DEATH RATES

95 cities	126	[6] 97	123	114	129	110	137	[2] 118	[3] 137	[2] 135
New England	132	60	118	100	134	51	149	102	151	121
Middle Atlantic	138	98	151	123	140	119	147	117	166	127
East North Central	98	89	89	103	103	97	117	97	[4] 109	105
West North Central	74	87	74	71	118	100	120	91	91	98
South Atlantic	166	147	106	149	155	138	127	164	[5] 153	186
East South Central	103	127	134	199	171	148	129	[2] 162	109	[2] 243
West South Central	207	112	163	108	150	103	172	194	84	233
Mountain	146	99	210	54	109	216	273	135	164	243
Pacific	124	[6] 76	152	103	113	110	124	131	148	165

[2] Louisville, Ky., not included.
[3] Terre Haute, Ind., and Norfolk, Va., not included.
[4] Terre Haute, Ind., not included.
[5] Norfolk, Va., not included.
[6] Los Angeles, Calif., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1926 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1926	1927	1926	1927
Total	101	95	30,443,800	30,966,700	29,783,700	30,295,900
New England	12	12	2,211,000	2,245,900	2,211,000	2,245,900
Middle Atlantic	10	10	10,457,000	10,567,000	10,457,000	10,567,000
East North Central	16	16	7,650,200	7,810,600	7,650,200	7,810,600
West North Central	12	10	2,585,500	2,626,600	2,470,600	2,510,000
South Atlantic	21	20	2,799,500	2,878,100	2,757,700	2,835,700
East South Central	7	7	1,008,300	1,023,500	1,008,300	1,023,500
West South Central	8	7	1,213,800	1,243,300	1,181,500	1,210,400
Mountain	9	9	572,100	580,000	572,100	580,000
Pacific	6	4	1,946,400	1,991,700	1,475,300	1,512,800

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended December 17, 1927.—The following report for the week ended December 17, 1927, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

Egypt.—Alexandria.
India.—Bassein, Rangoon.

CHOLERA

India.—Tuticorin, Calcutta, Rangoon.
French India.—Pondicherry.
Straits Settlements.—Singapore.
Siam.—Bangkok.

SMALLPOX

Aden Protectorate.—Aden.
India.—Bombay, Calcutta, Madras, Rangoon.
Dutch East Indies.—Belawan-Deli.
Sarawak.—Kuching.
French Indo-China.—Saigon.
Manchuria.—Mukden.

Returns for the week ended December 17 were not received from Basra, Iraq; Bandjermasin, Dutch East Indies; Canton, China; or Vladivostok, Union of Socialist Soviet Republics.

ANGOLA

Communicable diseases—September, 1927.—During the month of September, 1927, communicable diseases were reported in Angola as follows:

Disease	Coast districts	Interior	Land frontier	Total
Ancylostomiasis	4	3		7
Beriberi	1			1
Bilharzia	2	3		5
Cerebrospinal meningitis	2			2
Chicken pox	12	1		13
Dysentery	27	28	5	60
Homoglobin fever	7	3	1	11
Influenza	52	70	74	196
Leprosy	1			1
Lethargic encephalitis	1			1
Malaria	245	74	117	436
Measles	3			3
Mumps	2		6	8
Pneumonia	17	29	11	57
Puerperal fever	1	1		2
Relapsing fever	1	1	1	3
Scabies	5			5
Smallpox [1]	4	1	5	10
Tetanus	1	1	1	3
Trypanosomiasis [2]	94	25	23	142
Tuberculosis	19	5	2	26
Typhoid fever	4		1	5
Venereal diseases	106	38	42	186
Whooping cough	5			5
Yaws	70	88	21	179

[1] 2,708 vaccinations performed.
[2] Of unknown nature; 6,260 atoxylizations made.

Yellow fever—Kongo River ports—January 3, 1928.—Information dated January 3, 1928, shows seven cases of yellow fever reported at the ports of Boma and Matadi, Kongo River.

CANADA

Communicable diseases—Week ended December 17, 1927.—The Canadian Ministry of Health reports cases of certain communicable diseases from six Provinces of Canada for the week ended December 17, 1927, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever	1				1		2
Influenza	3			1			4
Smallpox				2	15	6	23
Typhoid fever		4	18		1	2	25

Vital statistics—Quebec—October, 1927.—Births and deaths in the Province of Quebec for the month of October, 1927, were reported as follows:

Estimated population	2,604,000	Deaths from—Continued.	
Births	6,061	Diphtheria	44
Birth rate per 1,000 population	27.93	Heart disease	276
Deaths	2,709	Influenza	30
Death rate per 1,000 population	12.48	Measles	11
Deaths under 1 year	862	Pneumonia	148
Infant mortality rate	142.22	Poliomyelitis	2
Deaths from—		Scarlet fever	14
Accidents (all)	85	Syphilis	2
Cancer	155	Tuberculosis (pulmonary)	144
Cerebrospinal meningitis	7	Tuberculosis (other forms)	39
Diabetes	21	Typhoid fever	21
Diarrhea	234	Whooping cough	30

CANARY ISLANDS

Plague—Las Palmas—November 23, 1927.—Under date of November 23, 1927, the occurrence of a new case of plague was reported at Las Palmas, Canary Islands.

DAHOMEY

Yellow fever—Grand Popo—November 21, 1927.—One fatal case of yellow fever (European) was reported as having occurred on November 21, 1927, at Grand Popo, Dahomey.

IRAQ

Cholera—November 6–19, 1927—Summary to November 19, 1927.—During the two weeks ended November 19, 1927, cholera was reported in Iraq as follows:

Place	Week ended—				Summary to Nov. 19, 1927	
	Nov. 12, 1927		Nov. 19, 1927			
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Amarah	3	3	2	2	183	145
Baghdad	13	2	8	2	32	10
Basra					417	337
Diwaniyah	1		2	1	91	50
Hillah	5	1	53	29	87	50
Kerbala	2	2	2	2	43	31
Kut	5	3			34	22
Muntafiq	4	2	14	10	207	131
Ramadi	27	14	21	16	85	63
Total	60	27	102	62	1,179	839

SALVADOR

Mortality, general—Mortality from communicable diseases—July–September, 1927.—During the three months ended September 30, 1927, 7,604 deaths from all causes were reported in the Republic of Salvador. Population as of June 30, 1927, 1,600,000. Deaths from certain communicable diseases were reported as follows: Diphtheria, 4; gastroenteritis, 210; measles, 54; tuberculosis, 174; typhoid fever, 11. The general mortality for the three months separately, was, July, 2,737 deaths; August, 2,533; September, 2,334.

SENEGAL

Plague—Two weeks ended December 11, 1927.—A few isolated cases of plague were reported for the week ended December 11, 1927, in the Baol region.

Yellow fever.—There were 5 fatal cases of yellow fever reported at Dakar, Senegal, during the two weeks ended December 11, 1927.

VIRGIN ISLANDS

Communicable diseases—November, 1927.—During the month of November, 1927, communicable diseases were reported in the Virgin Islands of the United States as follows:

Island and disease	Cases	Remarks
St. Thomas and St. John:		
Dengue	7	
Gonorrhea	4	
Pellagra	2	
St. Croix:		
Gonorrhea	1	
Syphilis	14	Secondary.
Uncinariasis	5	Necator americanus.

YUGOSLAVIA

Communicable diseases—November, 1927.—During the month of November, 1927, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	51	7	Measles	2,728	18
Cerebrospinal meningitis	3	1	Poliomyelitis	2	
Diptheria	331	60	Scarlet fever	1,834	238
Dysentery	104	7	Tetanus	20	1
Leprosy	1		Typhoid fever	647	79
Lethargic encephalitis	3		Typhus fever	1	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Week ended—															
		September, 1927				October, 1927					November, 1927				December, 1927		
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17
China:																	
Amoy	C	18	21	19	14	10	4	2									
	D	1	2														
Canton	C	10	17	7	2	6		2	6	5	1	6					
	D	6	10	7	2	6		2	6	5	1	5					
Foochow	C	P		P	P	P	P	P	P								
Hong Kong	C	1	P	P	P	P	P	P									
	D	1															
Shanghai	C	1	3	2		1	2										
	D	25	22	21	6	4		2	1								
Swatow	C	P	P		P		P	P	P	P	P						
Tientsin	C	4	3	5	3	2											
India	C	11,180	8,391	6,630	5,189	4,907	4,055	6,142	5,056	5,303	4,845						
	D	5,559	4,278	3,532	2,526	2,549	2,104	3,027	2,691	2,867	2,641						
Bombay	C	1	1	1								2					
	D	1	1									2					
Calcutta	C	18	19	20	19	21	13	34	33	28	35	65	71	156			
	D	10	13	5	11	15	11	19	19	22	25	42	49	106	77	55	43
Madras	C	29	8	15	7	4	9		1			6	7				
	D	24	11	6	7	3	3	1	1			3	4	1		1	
Rangoon	C				2	3	1		2		1		1	3			
	D				2	3	1		1	1		3	4	2	1	2	1
India, French Settlements in	C	6	4	1													
	D	3	4	1													
Karikal	C	1															
	D	1															
Pondicherry	C	4	4	1	6												
	D	2	4	1	8												
Indo-China:																	
Cochin-China—																	
Saigon	C						1										

Iraq:[1]																	
Amarah	C								35	4	8	3	2			1	
	D								23	6	8	3	2			1	
Baghdad	C								1		10	13	8				
	D								1		5	2	2				
Basra	C		21						1								
Diwaniyah	C								28	4	3	1	2				
	D								17	2			1				
Hillah	C								12	7	3	5	53				
	D								7	6	2	1	29				
Kerbala	C								3	1	4	2	2				
	D								3	1	5	2	2				
Kut	C								11	9	1	5					
	D								8	4	1	3					
Muntafique	C								4			4	14				
	D								1			2	10				
Ramadi	C									19	18	27	21				
	D									10	23	14	16				
Java:																	
Batavia	C										1		25	2			
	D										1		15	2			
Siam	C	4	5	21		6	4	8	8	14	23	43					
	D	3	3	11		4	2	5	7	10	15	25					
Bangkok	C	1	1	1			2	3	1		1		3		1	1	1
	D			1				3	1		1		1		1		1
Straits Settlements:																	
Singapore	C									1				1	2		2
	D									1				2			2
On vessel S. S. Tabaristan; at Basra	C						1										

Place		September, 1927			October, 1927			November, 1927		
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30
Indo-China (French)	C	452	206	241		345				
Annam	C	388	146	106		140	27	13	75	38
Cambodia	C	8	25	42		97	5	76	1	28
Indo-China (French)—Con.										
Cochin-China	C	17	35	92		79	12	21	27	52
Laos	C	16				29	6	10		
Tonkin	C	23		1						1

[1] From July 24 to Oct. 8, 1927, 831 cases and 617 deaths from cholera were reported in Iraq, of these 131 cases and 103 deaths occurred in Amarah; 416 cases and 337 deaths in Basra; 53 cases and 30 deaths in Diwaniyah; 7 cases and 5 deaths in Hillah, 31 cases and 18 deaths in Kerbala; 8 cases and 6 deaths in Kut; and 185 cases and 118 deaths in Muntafique.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Week ended—																	
		September, 1927				October, 1927					November, 1927				December, 1927				
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31
Algeria:																			
Oran	C		1								1		1						
	D		1																
Argentina:																			
Bahia Blanca	C													1					
Cordoba	C					P	P	P	P	P				10					1
Firmat	C																1		
Quilino	C													1					
Rosario	C													1			6		3
Unacha	C																1		
Azores:																			
St. Michaels Island	C		1		1	1			2	1		1	1	1	1	1			
	D		1			1										1			
British East Africa:																			
Tanganyiki	D				10	10					10								
Canary Islands:																			
Las Palmas	C						4	4	1					1					
Ceylon:																			
Colombo	C	1		1	1	2	3												
	D	1		1	1														
China:																			
Tungliao	D							200											
Egypt:																			
Alexandria	C	1												5	2				
	D													5	2				
Suez	C		1																
Greece:																			
Mitylene	C				5														
Patras	C	2				1					1								
	D					1					1								
India	C	403	1,087	612	608	655	715	920	956	812	1,015								
	D	216	569	324	319	381	359	508	544	495	551								
Bombay	C	3	1	1	2		2		2										
	D	2	1	1	1		2		1										
Calcutta	C	18																	
	D	10																	
Madras	C	144	111	87	123	88	156	167	172										
	D	76	62	43	49	60	72	72	84										

Rangoon	C	2		4		3	4	1	3	5	2		4						
	D	2		4		3	4	1	3	5	2		4						
Indo-China:																			
Saigon	C		1	1															
Java:																			
Batavia	C	18	14	17	21	24	33	42	31	41	29	31							
	D	18	14	17	21	24	33	41	31	41	29	31							
East Java and Madura	C	5	4	2	7	3	3	7	4	3	4								
	D	5	4	2	7	3	3	7	4	3	4								
Senegal	C		[illegible]		129														
	D				75														
Baol	C	32		27	13	39		56					P		P				
	D	11		15	7	26		14											
Cayor	C	81	103	175	104	101	45	20	10	32	8	8	P						
	D	27	58	90	58	57	16	10	5	20	4	4							
Dakar	C	9	5	5	1	1													
	D	4	4	3	1														
Louga	C				5		8												
	D				4														
Rufisque	C	4	9	2	1														
	D	3	7	1	1														
Thies	C	2		2	5					1									
	D	2		1	4														
Siam	C						1	11	1										
	D						1	8			1								
Bangkok	C						1		1										
	D										1								
Turkey:																			
Constantinople	C				1	1													
	D					1													
Union of South Africa:																			
Cape Province—																			
Richmond District	C									2									
	D									2									

Place		July	August	September	October	November
Ecuador:						
Guayaquil	C	5	7	3	4	9
	D					3
Madagascar:						
Ambositra	C	6	1			
	D	6	1			
Antisirabe	C		34	5		
	D		34	4		
Itasy	C	14	11	21		
	D	14	7	20		

Place		July	August	September	October	November
Madagascar—Continued.						
Moramanga	C	5	4	3		
	D	5	4	3		
Tananarive	C	21	48	142		
	D	19	43	127		
Peru	C	8	11			
	D	7	6			
Callao	D	3				

Algiers, Algeria, 2 cases, Oct. 11-20. Indo-China (French), 8 cases, Sept. 1-10; 5 cases, Sept. 11-20. Beirut, Syria, 1 case, Sept. 1-10; 1 case, Oct. 21-31.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Week ended— Sept. 3, 1927	Sept. 10	Sept. 17	Sept. 24	Oct. 1, 1927	Oct. 8	Oct. 15	Oct. 22	Oct. 29	Nov. 5, 1927	Nov. 12	Nov. 19	Nov. 26	Dec. 3, 1927	Dec. 10	Dec. 17	Dec. 24
Algeria:																		
Oran	C										10	4	6	9				
Arabia:																		
Aden	C												1		1			
Brazil:																		
Rio de Janeiro	C			3						1								
	D			6						1								
British East Africa:																		
Tanganyiki	D			8				7										
British South Africa:																		
Northern Rhodesia	C		18					44			10	22	3					
	D							1			23		1					
Southern Rhodesia	C												3					H
Canada:																		
Alberta	C	3	1	5	8	5	4	5	9	6	2	1	1	7	3	3	6	
Edmonston	C									1				6		1	1	
British Columbia—																		
Vancouver	C	2														4		
Manitoba	C	2		7			2		5	3	14		2	1	3	1	2	
Winnipeg	C			4			1		1				2			1	1	1
New Brunswick	C			2														
Nova Scotia	C			1				1										
Halifax	C							1										
Ontario	C			12	10	6	26	26	38	64	38	77	86	71	90	82		
Hamilton	C														2			
Kingston	C												1					1
Ottawa	C	9	13	12	6	3	15	23	26	47	17	51	19	10	19		34	18
Toronto	C		1		1		3	1	6	2	16	3	13		25	14		7
Windsor	C							9										
Quebec	C								8	7	3	12	3	8	5	3		
Montreal	C											1						1
Quebec	C																2	
Reviere du Loup	C												3					

Saskatchewan	C	13	33		22	12		8	11	5	12	2	14	9	19	15	15	
Moose Jaw	C		9		7				3								1	
Regina	C						5					1					1	
Saskatoon	C															2		
China:																		
Canton	C				1													
	D				1													
Chefoo	C				1			P		P				P				
	D				1													
Foochow	C		P					P	P		P							
Hong Kong	C	2																
	D	1		1														
Manchuria—																		
Changchun	C													1				
Dairen	C								1		2							
	D								1									
Fushun	C			1								1						
Mukden	C					1			1	1								
Pensihu	C					1												
Tientsin	C					12			1	8								
Egypt	C	3																
	D	1				1												
Great Britain:																		
England and Wales	C	111	146	126	125	122	149	124	200	199	219	258	226	233	366			
Bradford	C									1	5	3	2	8	6		2	
Bristol	C								6	1			3	2	4			
Cardiff	C									1								
Leeds	C	3				3	1		6	1	1	1	2	3	3			
Manchester	C						1	2			1	1	4	2	5		8	
Newcastle-upon-Tyne	C			2		1		5		2	6		1	28	18	5	4	
Sheffield	C				1		3	3	4	4			2	1	8			
India	C	1,456	1,109	1,111	722	923	593	777	860	779	805							
	D	397	266	284	173	179	159	171	206	190	200							
Bombay	C	7	3	1	1	4	2		4	2		2						
	D	5	2	1					2	2		1						
Calcutta	C	4	6	10	2		4	1					5					
	D	2	5	5	2		3	1	1				2					
Madras	C	2			2	3	1	2	2	3		2	2					
	D			1	1					1		1						
Rangoon	C	2		1	6	2	8		7	4		1	1					
	D	1			1	1	1		1	1								
Indo-China:																		
Saigon	C		1															
Iraq:																		
Baghdad	C		1			5			2			5						
	D		1			3			1			4						
Basra	C			4				2										
	D			4				2										
Italy:																		
Rome and vicinity	C		1															
Jamaica (outside Kingston) (alastrim)	C	2	2	2	3	1	4	4		7				1				
Kingston (alastrim)	C	2		1			2											

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Week ended—														
		September, 1927				October, 1927					November, 1927				December, 1927	
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10
Bulgaria:																
Sofia	C					8	4	3	2	3	1	2				
	D										1					
Chile:																
Antofagasta	D					1										
Valparaiso	C	1												1	1	
	D	1											1			
China:																
Tientsin	C				2											
Egypt	C					3	3	5	1		4					
	D					2	1	1	1							
Port Said	C					1									1	
Ireland:																
Cork County	C															3
Donegal County—Letterkenny	C								4							
Mexico:																
Mexico City (including municipalities in Federal District)	C	9	4	1	5	7		3	8	9	6	2	11	7	6	
	D										2					
Palestine	C	3		5			3						2	3	1	
Haifa	C						2						1	1		
Herzliah	C													1		
Jaffa	C					1								1		
Nazareth	C												1			
Safad	C													1		
Tel-Aviv	C						1							1	1	
Poland	C	12	5	12	6	10	9			35	12					
	D			2		3	1			6	3					
Portugal:																
Oporto	C									1						
Rumania	C	2	2	9	3	5										
	D					1										

Syria:																
Aleppo	C			2												
Tunisia	C			1				2	1							
Union of South Africa:																
Cape Province	C	P				P	P	P	P							
Natal	C								P							
Orange Free State	C					P										
Transvaal—																
Johannesburg	C							5								

Place		September, 1927			October, 1927	
		1-10	11-20	21-30	1-10	11-20
Algeria	C	5	3	2	7	4
	D					1
Algiers	C	1	5		1	1

Place		September, 1927			October, 1927	
		1-10	11-20	21-30	1-10	11-20
Bulgaria	C	5	1	1		
	D		1	1		
Morocco	C	3	2	2	6	4

Place		July	August	September	October	November
Chosen	C	72	17			
	D	8				
Chemulpo	C	1	2			
Gensan	C	2				
Seoul	C	2	3		2	
	D	1			1	
Czechoslovakia	C	6				
Japan	C	1				

Place		July	August	September	October	November
Latvia	C	6				
Mexico	C					
	D	12				
Peru:						
Arequipa	D		2	1	2	
Lima	D	8				
Yugoslavia	C	11	9		1	1
	D	4	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Week ended— Sept. 3, 1927	Sept. 10	Sept. 17	Sept. 24	Oct. 1	Oct. 15	Oct. 22	Oct. 29	Nov. 5	Nov. 12	Nov. 19
Liberia: Monrovia	C		1									
Nigeria	C			2								
	D			2								
Senegal	C					5		5	9	16	6	7
	D					5		4	8	10	4	6
Dakar	C			P					3	6		5
	D								2	4		4
Geoul	C					1						
	D					1						
Goree, Island of	C	2										
	D	2										
Kebemer	C						1	1				
	D						1	1				
Kelle	C						2		1			
	D						1		1			
Keur Samba Kane	C								1	1		
	D									1		
Keur Madiop	C								1			
	D								1			
Khombole	C					1						1
	D					1						1
Louga	C					1			2	1	1	
	D					1			2	1	1	
Senegal—Continued												
Mekhe	C							1	1	2	2	
	D								1	1	1	
M'Dande	C							1		2	1	
	D							1		1		
Pout	C				1							
	D				1							
Rufisque	C						1					
	D						1					
St. Louis	C					1						
	D					1						
Sebikotane	C							1		2	1	
	D							1			1	
Thies	C			1	2	1		1	1	2	1	1
	D			1	2	1		1	1	2	1	1
Tiaroye	C	1										
	D	1										
Tivaouane	C		1									
On vessel, S. S. Desirade, at Leixoes, Portugal	C			1								
	D			1								

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

PUBLIC HEALTH REPORTS

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PREVALENCE OF SCARLET FEVER IN THE UNITED STATES

Preliminary reports of cases of scarlet fever from the health officers of 37 States for 52 weeks of the years 1925, 1926, and 1927 show that the disease was more prevalent during 1927 than it was during the two preceding years. The figures are as follows:

	Cases
1925	135, 937
1926	143, 150
1927	158, 978

The estimated population of these States was 86,571,000 in 1925 and 90,482,000 in 1927.

The number of cases of scarlet fever reported by these 37 States for the last eight weeks of the year was less in 1927 than it was in either 1925 or 1926. The following table gives a comparison of the reports by four-week periods for the last 20 weeks of the years 1925 to 1927, inclusive:

Four weeks ended—	Corresponding week		
	1927	1926	1925
Sept. 10, 1927	3, 419	3, 121	2, 812
Oct. 8, 1927	5, 378	5, 624	4, 294
Nov. 5, 1927	8, 586	9, 823	8, 122
Dec. 3, 1927	10, 860	13, 330	11, 617
Dec. 31, 1927	11, 943	13, 876	12, 222
Total	40, 186	45, 774	39, 067

HOW TO GIVE ARTIFICIAL RESPIRATION BY THE PRONE PRESSURE METHOD[1]

1. Lay the patient on his belly, one arm extended directly overhead, the other arm bent at elbow and with the face turned outward and resting on hand or forearm so that the nose and mouth are free for breathing. (See fig. 1.)

2. Kneel straddling the patient's thighs with your knees placed at such a distance from the hip bones as will allow you to assume the position shown in Figure 1.

[1] This method has been approved by the following organizations: American Telephone & Telegraph Co.; American Red Cross; American Gas Association; Bethlehem Steel Co.; National Electric Light Association; National Safety Council; Bureau of Medicine and Surgery, Navy Department; Office of the Surgeon General, War Department; U. S. Bureau of Mines; U. S. Bureau of Standards; and U. S. Public Health Service.

Place the palms of the hands on the small of the back with fingers resting on the ribs, the little finger just touching the lowest rib, with the thumb and fingers in a natural position, and the tips of the fingers just out of sight. (See fig. 1.)

3. With arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the patient. The shoulder should be directly over the heel of the hand at the end of the forward swing. (See fig. 2.) Do not bend your elbows. This operation should take about two seconds.

4. Now immediately swing backward so as to remove the pressure completely. (See fig. 3.)

5. After two seconds, swing forward again. Thus repeat deliberately twelve to fifteen times a minute the double movement of compression and release, a complete respiration in four or five seconds.

6. Continue artificial respiration without interruption until natural breathing is restored, if necessary, four hours or longer, or until a physician declares the patient is dead

7. As soon as this artificial respiration has been started and while it is being continued, an assistant should loosen any tight clothing about the patient's neck, chest, or waist. *Keep the patient warm.* Do not give any liquids whatever by mouth until the patient is fully conscious.

8. To avoid strain on the heart when the patient revives, he should be kept lying down and not allowed to stand or sit up. If the doctor has not arrived by the time the patient has revived, he should be given some stimulant, such as one teaspoonful of aromatic spirits of ammonia in a small glass of water or a hot drink of coffee or tea, etc. The patient should be kept warm.

9. Resuscitation should be carried on at the nearest possible point to where the patient received his injuries. He should not be moved from this point until he is breathing normally of his own volition and then moved only in a lying position. Should it be necessary, due to extreme weather conditions, etc., to move the patient before he is breathing normally, resuscitation should be carried on during the time that he is being moved.

10. A brief return of natural respiration is not a certain indication for stopping the resuscitation. Not infrequently the patient, after a temporary recovery of respiration, stops breathing again. The patient must be watched and if natural breathing stops, artificial respiration should be resumed at once.

11. In carrying out resuscitation it may be necessary to change the operator. This change must be made without losing the rhythm of respiration. By this procedure no confusion results at the time of change of operator and a regular rhythm is kept up.

FIGURE 1

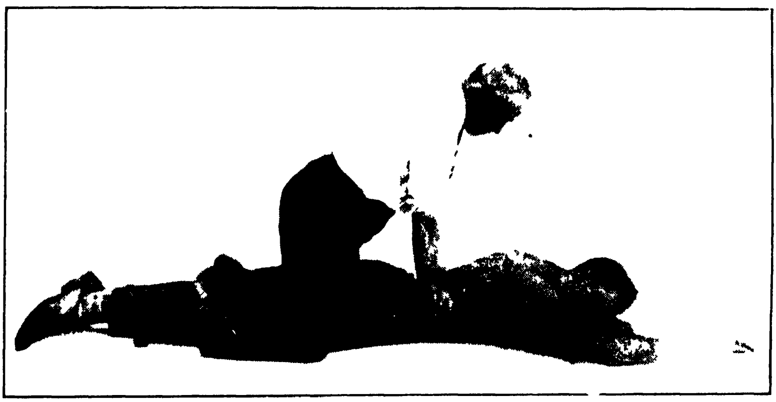

FIGURE 2

FIGURE 3

A RESURVEY OF ENDEMIC THYROID ENLARGEMENT IN CINCINNATI

By Robert Olesen, *Surgeon United States Public Health Service*

The incidence of endemic thyroid enlargement among the school children of Cincinnati was less in 1927 than it was in 1924. Moreover, there was a notable decrease in the number of enlargements of considerable size during the three-year period. These conclusions are apparently substantiated by a resurvey made during the 1926–27 school session. Therefore, it becomes a matter of importance to determine, if possible, what were the factors involved in the changes. However, before proceeding to the consideration of the probable causes for the improvement in the goiter situation, it may be of interest to discuss briefly the purpose and value of resurveys, incidentally citing instances in which such investigations have been undertaken.

The purpose and value of resurveys.—Just as a primary thyroid survey is valuable in indicating the extent to which endemic goiter prevails in a given community, so does a reexamination of the same group indicate the extent to which prophylactic endeavor has proved successful. A reexamination of thyroids also accomplishes other useful purposes, among which may be mentioned the determination of the results of goiter treatment and the extent to which thyroid enlargement disappears spontaneously.

Resurveys, however, are seldom made, and if they are made, usually fail to find their way into the literature. Yet, it is obvious that the real effect of goiter prophylaxis can not be ascertained without a carefully planned check up. Among the conspicuous resurveys, attesting the value of iodine prophylaxis, were those of Marine and Kimball in Akron, Ohio. Four annual examinations of the same girls showed a decrease in the size of many existing enlargements and maintenance of thyroid equilibrium among normal individuals.

In Rochester, N. Y., resurveys have followed iodization of the water supply. Apparently endemic thyroid enlargements were reduced in number after the institution of this procedure, though other prophylactics were undoubtedly used at the same time. The failure to record the total number of examinations made in each survey casts doubt upon the validity of the conclusion that goiter incidence was reduced. Moreover, no attempt appears to have been made to determine the possible coincident effect of other iodine-containing prophylactics which may have been used. Resurveys are also available from Lorain, Ohio, and Aroostook County, Me., though no significant changes are recorded.

Provided goiter surveys are made by the same observers, under similar conditions, the resulting information serves to indicate changes, or lack of changes, which either have come about naturally or followed definitely planned prophylaxis. While the desirability of thyroid examinations is obvious, it may be pointed out that the best results will accrue when the examiners possess a reasonable amount of skill, training, and experience. Especially are these qualifications essential when it is recalled that the dividing line between the normal and abnormal thyroid gland is not definite and that classification of thyroid size is entirely arbitrary.

Findings during first Cincinnati survey.—During the 1923–24 school session a thyroid survey was made of 47,493 children in the elementary schools of Cincinnati, Ohio.[1] The purpose of this survey was twofold; first, to determine the incidence of endemic goiter; and, second, to make appropriate recommendations for dealing with the conditions discovered.

Examination of 23,710 boys during the first Cincinnati survey disclosed an incidence of thyroid enlargements of all degrees amounting to 26.6 per cent. Among 23,783 girls the percentage was higher, 39.8 per cent. It was particularly noted that a considerable number of goiters of moderate and marked size were present among those examined. As a result of the findings it was recommended to the board of health of Cincinnati that the general use of iodized table salt be advocated for the prevention of simple thyroid enlargement. Following this recommendation iodized salt was used to a considerable extent in the city. The Cincinnati Academy of Medicine withheld its official sanction of this prophylactic, but did not go on record against it.

Methods employed and scope of the 1927 survey.—The method of examining and the classification of enlargements noted during the 1927 survey was identical with the procedure adopted in 1924. The conduct of the thyroid survey has been presented in several service publications.[1, 2]. In 1924 the examinations were made by the writer in conjunction with the district physicians of the board of health, all of whom had been carefully schooled in uniform procedure. In 1927 the examinations were made exclusively by two examiners, the writer being assisted by Acting Assistant Surgeon Neil E. Taylor, who had already had two years of experience with the original method of examination.

In 1924 the thyroid survey included the children in 61 elementary public and 43 elementary parochial schools. In 1927 fewer children, 12,722 boys and 12,818 girls, were examined, but 5 high schools,

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1 Robert Olesen: Thyroid survey of 47,493 elementary school children in Cincinnati. Pub. Health Rep., vol. 39, No. 30, pp 1777–1802 (July 25, 1924). (Reprint No. 941.)

2 Robert Olesen: Endemic goiter in Colorado. Pub. Health Rep, vol 40, No. 1, pp. 1-23 (Jan. 1, 1925). (Reprint No 983.)

as well as 31 elementary public and 4 elementary parochial schools, were included. The schools included in the 1927 survey, while fewer in number than in 1924, were equally representative of location, environment, economic condition and other factors likely to exert an influence upon thyroid status.

RESULTS OF 1927 SURVEY

Age incidence of goiter.—Among the 12,722 boys surveyed in 1927 there were 2,859 boys having enlargements of all degrees, a percentage of 22.5. Among the girls, on the other hand, there were 5,026 having enlargements, a percentage of 39.2. The numbers and percentages of children having thyroid enlargement have been set forth in Table 1, according to age, sex, and color. The percentage incidence of simple goiter at each age among the boys is shown in Chart 1. In the same chart is displayed the incidence among the

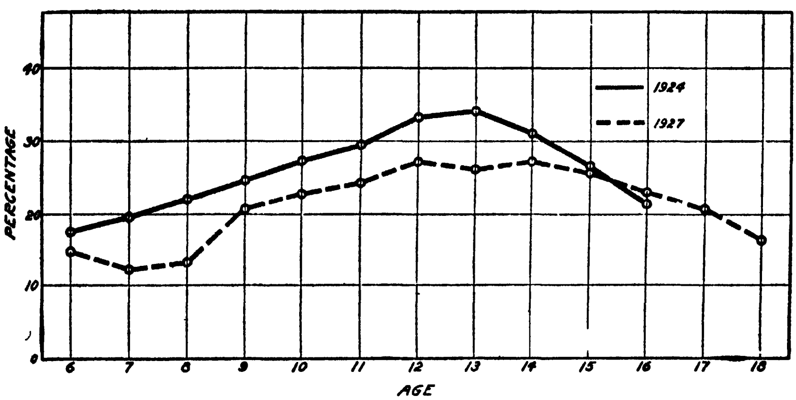

CHART 1.—Comparison of age incidence of endemic thyroid enlargement among 23,710 boys examined in 1924 and 12,722 boys examined in 1927 in Cincinnati

boys examined in 1924. A similar graphic representation for the girls of each age is presented in Chart 2. In these charts it will be noted that there is a gradual though steady increase in the incidence of thyroid enlargement among boys, beginning at the age of 6 and reaching a peak between 12 and 14 years. Thereafter there is a similarly gradual decrease in thyroid involvement until the age of 18 is reached. Among the girls the increase in percentage incidence of thyroid enlargement is steady from 6 to 16 years of age.

Incidence of various degrees of thyroid enlargement.—That the vast majority of enlargements present in both sexes were very slight in character is indicated in Table 2. Ninety-four and five-tenths per cent of the boys and $78\frac{5}{10}$ per cent of the girls having enlargements were so classified. Slight enlargements were present to the extent of 5 per cent among the boys and 16.8 per cent among the girls having enlargements. Contrary to the findings in the 1924 survey,

there were very few moderate and marked thickenings among the boys examined in 1927. There were also fewer of the larger goiters among the girls, 2.1 per cent of the girls with enlargements being classed as having moderate and 0.28 per cent as having marked enlargements. Among the 2,859 boys with some degree of thyroid enlargement, 67 or 2.3 per cent were presumably adenomatous in character. There were 314 or 6.2 per cent of adenomatous glands among the 5,026 girls with enlargements. The numbers, degrees, and percentages of endemic thyroid enlargement among the boys and girls at each age period are shown in Table 3.

COMPARISON OF 1924 AND 1927 FINDINGS

When a comparison is made of the results of the 1924 and 1927 thyroid surveys, some interesting observations are possible. In the

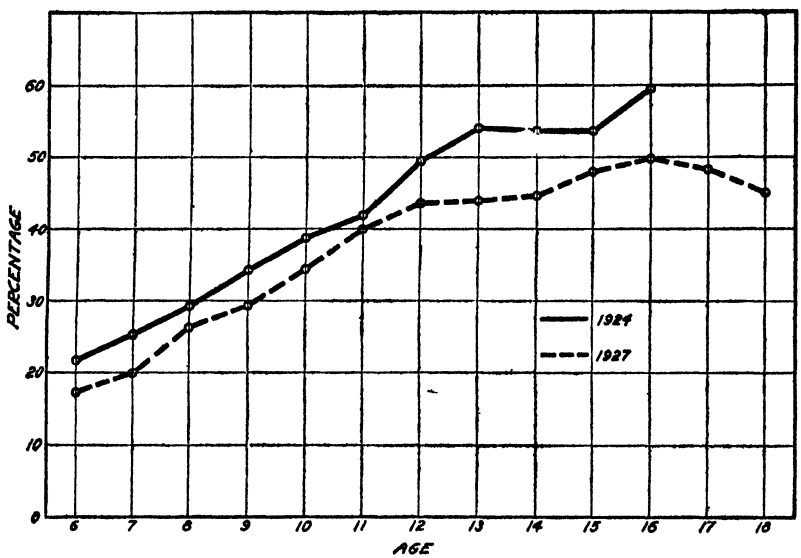

CHART 2.—Comparison of age incidence of endemic thyroid enlargement among 23,783 girls examined in 1924 and 12,818 girls examined in 1927 in Cincinnati

aggregate, the incidence of endemic thyroid enlargement differs little in the two surveys. Thus, the total percentage of thyroid enlargement among the boys in 1924 was 26.6, and it was 22.5 in 1927; among the girls 39.8 in 1924 and 39.3 in 1927.

Inasmuch as the aggregate rates were approximately the same in the two surveys, it becomes necessary to institute a careful study in order to detect evidence of changes that may have occurred in the three-year interval. In chart 1 the curves showing the incidence of endemic thyroid enlargement among the boys examined in 1924 and 1927 are presented graphically. Similar curves for the girls are shown in chart 2. A study of the curves in these charts shows

uniform trends for each sex and a lessened incidence at each age in 1927. The apparent discrepancy between the approximately similar total incidence rates and the interval between the age incidence can probably be explained by the inclusion of the 17 and 18 year age groups in the 1927 survey.

Differences in degrees of thyroid enlargement.—The percentages of each degree of thyroid enlargement encountered during the 1924 and 1927 surveys are set forth in Table 3. These data are shown graphically in chart 3. It will be seen that more very slight thyroid enlargements were recorded in 1927 than in 1924, the excess being more marked among the girls. However, among the other degrees of enlargement there were marked reductions in the percentages noted in 1927 when compared with the findings of the earlier survey.

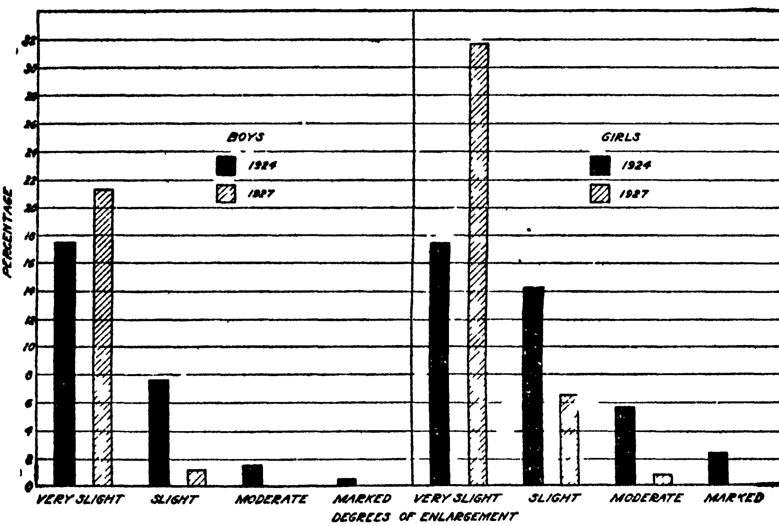

CHART 3.—Comparison of degrees of endemic thyroid enlargement among 23,710 boys and 23,783 girls examined in 1924 and 12,722 boys and 12,818 girls examined in 1927 in Cincinnati

In fact, moderate and marked thickenings were comparatively infrequent among the girls and rare among the boys examined in 1927.

A point of considerable interest in connection with the resurvey in 1927 was the increased incidence of simple thyroid enlargement among the colored girls. Repeated inquiry has elicited the information that relatively few colored children receive either prophylaxis or treatment for goiter. Then, too, it is known, as a result of studies made in Cincinnati, that the natural incidence of simple goiter is greater among colored children, and particularly among the girls.

CAUSES OF CHANGES OCCURRING BETWEEN THE TWO SURVEYS

The same children examined in both surveys.—The children included in the 1927 survey were, with minor exceptions due to the extensive

turnover peculiar to a large city, those examined in 1924. The children attending the first, second, and third grades in 1927 were not, of course, examined in 1924 because they were not in school at that time. However, those attending the sixth, seventh, and eighth grades in 1924 were again examined in 1927 by including the high schools, to which many of them had in the meantime advanced. In view of these facts, it may be concluded that the children examined in the two surveys were, with minor exceptions difficult of control, the same.

Reasons for changes in goiter incidence.—In seeking for an explanation of the reduction in the general incidence of goiter and the marked decrease in the number of thyroid enlargements of considerable size, a number of factors deserve consideration. Among these may be mentioned changes in methods of examining, altered standards of recording, and changes in the personnel engaged in making the examinations. The possibility of spontaneous disappearance or natural reduction in size of thyroid enalrgements must likewise receive a share of attention. Furthermore, the influence of prophylaxis and treatment also enters into the problem.

Variations in estimates of thyroid involvement.—As previously indicated, the writer supervised and actively participated in both surveys, coaching the other examiners in uniform methods of examining and classifying the thyroids. Consequently the results of the surveys may be regarded as comparable. As additional experience and skill in palpating the thyroid gland are gained there may be a tendency, unconsciously, to revise the arbitrary standards for classifying enlargements. An effort was made to prevent such errors from creeping into the work. As a matter of fact, it is believed that the thyroid enlargements were more sharply classified in 1927 than during the earlier investigation. All things considered, it is believed that no detectable changes in methods occurred which might distort the comparative figures. To some extent this contention is borne out by the similarity of trends, as indicated in charts 2 and 3.

Spontaneous reduction in thyroid enlargement.—It is well known that many endemic goiters tend to disappear spontaneously as children grow older. This tendency is particularly marked among boys after the age of 12 or 13 years. As to the factors involved in the voluntary subsidence of thyroid swelling, little is known beyond the fact that it does occur. However, it is not felt that spontaneous resolution of thyroid involvement accounts either for the decrease in goiter incidence or the reduction in size of existing enlargements noted between the two surveys.

Decrease in number of larger goiters.—The marked decrease in the number of goiters of considerable size is probably due to the action taken in behalf of many children who, in 1924, were found to have such enlargements. The results of the 1924 goiter survey were

afforded much publicity. Consequently many children received treatment from their family physicians. That such treatment was successful to a large extent is attested by the reduction in the sizes of many goiters. Credit must also be given the nurses of the Cincinnati Health Department, who "followed up" the children having moderate or marked thyroid enlargements and saw that appropriate medical treatment was secured. That goiter of marked size became less frequent in occurrence after the 1924 survey in Cincinnati was a fact noted by many lay observers, particularly school teachers, whose close contact with the children enabled them to see the changes.

Influence of prophylaxis.—Following the announcement that endemic goiter prevailed to a considerable extent in Cincinnati prophylactic measures were advocated and widely practiced. In addition to the rather general use of iodized table salt, various other iodine prophylactics were obtained by many children from their family physicians. The reduction in goiter incidence, though comparatively slight, suggested the possibility that iodized salt, the principal prophylactic recommended, may have had a share in the inprovement. However, as other preparations were undoubtedly used at the same time, it can not be asserted that iodized salt played the sole or principal rôle.

It is also difficult to estimate the influence of iodized salt or other prophylactics upon existing enlargements. Ordinarily it is doubtful whether iodine in prophylactic doses assists in reducing thyroid enlargements. However, in the present instance it may be surmised that iodized table salt and other iodine-containing preparations aided to some extent in reducing the size of the goiters. Further observations of more extensive and accurate character are manifestly required before a conclusion can be reached.

SUMMARY

1. A resurvey of endemic thyroid enlargement in Cincinnati, Ohio, in 1927, three years after the original thyroid survey, showed a lessened incidence of the disease and a considerable reduction in the number of goiters of moderate and marked degree.

2. The aggregate incidence of endemic goiter in 1927 was only slightly less than in 1924 but the age incidence was distinctly less in 1927. While iodized table salt was the chief prophylactic recommended and used, it is known that other iodine-containing preparations were also used. It may be surmised that iodized salt was a factor in the slight reduction of goiter revealed by the 1927 survey.

3. There was a notable decrease in the thyroid enlargements of considerable size noted in 1924 and again in 1927. This was due largely to efficient treatment instituted by physicians at the instigation of parents. It is possible that iodized salt and other prophylactics may also have exerted a favorable influence.

TABLE 1.—*Number and percentage of thyroid enlargements among 12,722 boys and 12,818 girls examined in the schools of Cincinnati, Ohio, during the 1927 session, by age, color, and sex*

Age	Boys									Girls								
	White			Colored			Total			White			Colored			Total		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
6	106	15	14.1	1	1	100.0	107	16	14.9	79	14	17.7	2	----	----	81	14	17.3
7	710	86	12.1	39	5	12.8	749	91	12.1	758	148	19.5	22	8	36.4	780	156	20.0
8	1,159	152	13.1	42	8	19.0	1,201	160	13.3	1,151	291	25.3	65	29	44.6	1,216	320	26.3
9	1,166	241	20.7	60	15	25.0	1,226	256	20.9	1,157	335	28.9	77	28	36.4	1,234	303	29.4
10	1,164	250	21.5	54	15	27.8	1,218	265	21.7	1,098	372	33.9	72	30	41.7	1,170	402	34.3
11	1,238	289	23 3	86	32	37.2	1,324	321	24.2	1,188	471	39.7	65	29	44.6	1,253	500	39.9
12	1,217	324	26.6	57	22	38.6	1,274	346	27.2	1,117	478	42.8	66	38	57.6	1,183	516	43.7
13	1,215	312	25.7	56	20	35.7	1,271	332	26.1	1,151	501	43.5	69	36	52.2	1,220	537	44.0
14	1,299	349	26.9	31	11	35.5	1,330	360	27.1	1,377	604	43.9	80	48	56.0	1,457	652	44.8
15	1,357	347	25 5	48	17	35.4	1,405	364	25.9	1,434	679	47.4	90	54	60.0	1,524	733	48.1
16	763	177	23.2	35	7	20.0	798	184	23.0	845	403	47.8	77	57	74.1	922	460	49.9
17	532	112	21.1	19	4	21.0	551	116	21.1	535	257	48.0	44	23	52.3	579	280	48.4
18	199	32	16.1	10	3	30.0	209	35	16.7	169	76	44.9	1	1	100.0	170	77	45.3
19 and over	52	12	23 0	7	1	14.3	59	13	22.0	28	15	53.6	1	1	100.0	29	16	55.2
Total	12,177	2,698	22.1	545	161	29.5	12,722	2,859	22.5	12,087	4,644	38.4	731	382	52.2	12,818	5,026	39.2

Explanation: A, number of children; B, number of thyroid enlargements; C, percentage of thyroid enlargements.

TABLE 2.—*Numbers and percentages of each degree of thyroid enlargement among 2,859 boys and 5,026 girls in the 1927 survey in Cincinnati*

Sex	Number and percentage	Degrees of enlargement					
		Very slight	Slight	Moderate	Marked	Very marked	Total
Boys	Number	2,703	144	10	2	----	2,859
	Percentage	94 5	5.0	0.35	0.07	----	100.0
Girls	Number	4,057	847	107	14	1	5,026
	Percentage	80.7	16.8	2.1	0.28	0.02	100.0

TABLE 3.—*Numbers and degrees of thyroid enlargement among 12,722 boys and 12,818 girls in Cincinnati (1927)*

Boys

Age	With enlarged thyroids						Normal	Total
	Degree of enlargement				Total	Per cent		
	Very slight	Slight	Moderate	Marked				
6	16	----	----	----	16	14.9	91	107
7	91	----	----	----	91	12.1	658	749
8	160	----	----	----	160	13.3	1,041	1,201
9	246	10	----	----	256	20.9	970	1,226
10	261	4	----	----	265	21.7	953	1,218
11	312	7	2	----	321	24.2	1,003	1,324
12	328	18	----	----	346	27.2	928	1,274
13	309	22	----	1	332	26.1	939	1,271
14	329	29	2	----	360	27.1	970	1,330
15	329	32	2	1	364	25.9	1,041	1,405
16	172	10	2	----	184	23.0	614	798
17	107	9	----	----	116	21.1	435	551
18	30	3	2	----	35	16.7	174	209
19 and over	13	----	----	----	13	22.0	46	59
Total	2,703	144	10	2	2,859	22.5	9,868	12,722
Per cent	21.2	1.2	0.08	0.0016	----	22.5	77.5	100.0

Table 3.—*Numbers and degrees of thyroid enlargement among 12,722 boys and 12,818 girls in Cincinnati (1927)*—Continued

Age	Girls								
	With enlarged thyroids							Normal	Total
	Degree of enlargement					Total	Per cent		
	Very slight	Slight	Moderate	Marked	Very marked				
6	14					14	17.3	67	81
7	155		1			156	20 0	624	780
8	310	10				320	26 3	896	1,216
9	340	21	2			363	29 4	871	1,234
10	373	26	3			402	34.3	768	1,170
11	424	73	2	1		500	39 9	753	1,253
12	416	91	7	2		516	43 7	667	1,183
13	416	109	9	3		537	44.0	683	1,220
14	488	138	24	1	1	652	44.8	805	1,457
15	509	192	30	2		733	48.1	791	1,524
16	339	98	19	4		460	49 9	462	922
17	198	73	8	1		280	48 4	299	579
18	61	14	2			77	45.3	93	170
19 and over	14	2				16	55 2	13	29
Total	4,057	847	107	14	1	5,026	39 2	7,792	12,818
Per cent	31.7	6.6	0.84	0.017	0.008		39.2	60.7	100.0

Table 4.—*Comparison of percentages of each degree of endemic thyroid enlargement (by sex and color) of 47,493 children examined in Cincinnati schools during the 1924 session and 25,540 children examined during the 1927 session*

Sex and color	Year of examination	Degree and percentage of enlargement				
		Very slight	Slight	Moderate	Marked and very marked	Total
White boys	1924	17.4	7.4	1.5	.43	26.7
	1927	20 9	1 1	.075	.008	22.1
White girls	1924	17.4	14.2	5.7	2.4	39.7
	1927	31 3	6 3	.75	.066	38.4
Colored boys	1924	17 4	9.0	1.2	.57	28.2
	1927	27 7	1.4	.2	.2	29.5
Colored girls	1924	18 2	18.4	7.2	2 9	46.7
	1927	37.5	11.5	2.3	.9	52.2

LEAD POISONING FROM THE USE OF SNUFF

A case of lead poisoning traced to the use of snuff adulterated by the addition of coloring materials containing lead, was reported in the Weekly Bulletin for November 5, 1927, issued by the New York City Department of Health. Attention is also called to the fact that snuff may be adulterated by lead pigments either for coloring purposes or to give spurious weight. The case reported is of clinical interest in showing the alertness that is sometimes necessary in discovering the cause of such poisoning. The following is taken from the Weekly Bulletin:

"One of the medical staff of Mount Sinai Hospital recently called the attention of the department of health to a male patient, who,

upon examination, presented a marked polyneuritic condition that was suggestive of poisoning by one of the heavy metals. Lead was suspected, and the only possible etiological factor in this case was thought to be snuff, which the patient habitually used. The patient's stool contained lead, and an examination of the specimen of the snuff used by the patient in the chemical laboratory of the department of health showed lead present.

"Investigation by the bureau of food and drugs, at the plant where the snuff used by this patient was manufactured, proved conclusively that the lead content of the snuff was due to the use of a yellow and green coloring material. When the analysis of the chemical laboratory indicated the source of the lead content, an embargo was placed on all coloring materials in the plant, and the manufacturer was ordered to discontinue the use of all coloring matter at once. Prosecution proceedings have been instituted against the manufacturer."

DEATH RATES IN A GROUP OF INSURED PERSONS

Rates for Principal Causes for November, 1927

The death rate for November among approximately 18,000,000 industrial policyholders in the United States and Canada was 8.5 per 1,000, according to the Statistical Bulletin for December, published by the Metropolitan Life Insurance Co. This is the same rate as that for November of last year for this group of persons.

Death rates (annual basis) for principal causes per 100,000 lives exposed, November 1927, as compared with October and with November, 1926

Cause of death	Rate per 100,000 lives exposed [1]			
	Nov. 1927	Oct. 1927	Nov. 1926	Year 1926
Total, all causes	849.8	769.7	850.2	945.6
Typhoid fever	4.3	3.7	6.2	4.2
Measles	1.0	.4	1.2	10.2
Scarlet fever	2.6	1.5	3.2	3.4
Whooping cough	3.9	4.1	6.1	9.6
Diphtheria	12.4	9.6	12.9	9.7
Influenza	11.0	6.5	13.5	31.1
Tuberculosis (all forms)	79.2	74.7	85.9	99.0
Tuberculosis of respiratory system	70.3	66.5	76.4	86.7
Cancer	73.5	71.6	72.2	73.7
Diabetes mellitus	16.2	15.0	16.1	16.7
Cerebral hemorrhage	53.2	49.0	50.6	55.6
Organic diseases of heart	135.2	112.0	125.5	134.8
Pneumonia (all forms)	66.0	46.3	71.6	98.2
Other respiratory diseases	14.9	12.6	11.8	13.0
Diarrhea and enteritis	23.1	36.6	27.7	29.8
Bright's disease (chronic nephritis)	66.7	60.5	70.5	73.5
Puerperal state	14.5	12.6	11.1	15.3
Suicides	8.0	7.4	8.0	7.7
Homicides	7.6	6.8	7.3	7.0
Other external causes (excluding suicides and homicides)	62.4	62.4	62.6	62.3
Traumatism by automobiles	20.8	20.3	19.8	16.8
All other causes	194.2	176.4	186.1	191.0

[1] All figures include infants insured under 1 year of age.

The mortality rates for the principal causes of death of major public health interest were lower than those prevailing last year, with the single exception of the rate for puerperal causes.

The mortality from organic heart disease was 7.7 per cent higher in November than it was a year ago. The rates for cancer and cerebral hemorrhage were also a little higher, while the death rate for Bright's disease was lower.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Liability of town for antirabic treatment.—(Massachusetts Supreme Judicial Court; Bryant *v.* Nolin et al., 158 N. E. 791; decided November 23, 1927.) The chairman of a town board of health requested the town physician to "look into the case" of a boy who had been bitten by a rabid dog. The boy's parents permitted antirabic treatment to be given, but with the expectation that the town would pay for same. "Rabies" and "dog bite requiring antirabic treatment" were diseases defined by the State department of public health as dangerous to the public health. In an action brought by the physician against the parents to recover for medical services rendered the child, the supreme court upheld the action of the trial court in directing a verdict for the defendants, saying:

> The order was clearly right. There was no express contract, and no contract was implied in fact or in law, to pay the plaintiff for the services rendered in the circumstances disclosed. Assuming the physician rendered services outside the terms of his employment as town physician to the board of health, and further assuming that such services were reasonably required by the board of health in making the provisions required by law for persons infected with a disease dangerous to the public health, the town was obligated to pay to the plaintiff the reasonable value of the services rendered at the request or at the direction of the board of health, and had a remedy over against the defendant[s] if they were able to pay. (G. L. c. 111, sec. 116; Haverhill *v.* Marlborough, 187 Mass. 150, 72 N. E. 943.)

Town held liable for sewage pollution of stream.—(Iowa Supreme Court; Stovern *v.* Town of Calmar, Winneshiek County, 216 N. W. 112; decided November 22, 1927.) An action was brought against a town for an injunction and damages on account of the pollution by sewage of a creek which flowed through the edge of plaintiff's farm. At the time of the trial in the lower court in October, 1926, the town had a sanitary sewage disposal plant about three-fourths completed. The trial court allowed the plaintiff damages, refused an injunction, and ordered the nuisance abated on or before January 1, 1927. Both parties appealed. The supreme court approved the amount allowed as damages by the trial court, but held that the latter court "should not have made its decree final, but the same should have been in its nature interlocutory, giving the defendant a reasonable time in which to abate the nuisance, but holding jurisdiction for the final determina-

tion herein as to the rights of the parties in this respect." The supreme court stated that it did not know whether the nuisance had been abated and remanded the case to the district court "for the purpose of taking evidence upon the single proposition as to whether a nuisance still exists, and for the purpose, that, upon said hearing, such decree with reference thereto as may be warranted by the evidence may be rendered."

Ordinance for prevention of pollution of source of city's water supply, located in United States forest reservation, held invalid.—(Washington Supreme Court; Brown *v.* City of Cle Elum, 261 P. 112; decided November 23, 1927.) The city of Cle Elum, under contract with the United States, took its water supply from a lake outside the city and within the limits of a United States forest reservation. The city, pursuant to statutory authority, passed an ordinance designed to prevent the pollution of the source of its water supply. This ordinance, among other things, prohibited swimming, fishing, and boating in the said lake. The United States had rented cottage sites along part of the lake, and the plaintiff in this case was a tenant of the United States. He sought to restrain the defendant city from enforcing or attempting to enforce the ordinance, particularly in so far as it prohibited or attempted to prohibit swimming, fishing, or boating in the lake. The validity of the ordinance was attacked on two grounds: (1) That its enactment was an attempted exercise of the police power of the city over lands and waters owned by the United States, and (2) that it was unreasonable. The case was heard before department 2 of the supreme court, and on April 28, 1927, a decision (255 P. 961) was rendered in favor of the city. Upon a reargument of the case before the court en banc the question was presented to the court as to whether or not the legislature could constitutionally delegate to a city authority to exercise police power beyond its territorial limits and outside the boundaries of property it may own beyond its territorial limits by the passing and enforcing of ordinances assuming to regulate the conduct of citizens beyond such limits and boundaries. The State constitution provided:

> Any county, city, town, or township may make and enforce within its limits all such local, police, sanitary, and other regulations as are not in conflict with general laws.

The court then held that, in view of this provision, those statutory provisions, which purported to give to the city the power to pass such an ordinance as the one involved in the instant case, could have no validity. The court said:

> This delegation of its police power by the State to various municipalities is strictly limited to the exercise of that power *within the limits* of such municipalities. Authorities are cited to the effect that the State, by legislative enactment, might delegate its police power to various municipalities to be exercised beyond

their limits, but those authorities will be found to have not arisen where a constitutional provision obtains such as the one existing in this State. In order for the appellant in this case to pass a valid ordinance under the sections of the code relied on, it would be necessary for the court to read out of the constitutional provision the words, "*within its limits*," and no case has been cited to us, and we have been unable to find one, where legislation similar to that here under consideration has been sustained where there also existed a constitutional provision such as ours. * * *

THE EIGHTH PAN AMERICAN SANITARY CONFERENCE—RESOLUTIONS—CORRECTION

In the report of the resolutions adopted at the Eighth Pan American Sanitary Conference, published in Public Health Reports for January 6, 1928, the word "maritime" was omitted before the last word, "travel," in paragraph (*b*), page 9. The concluding part of this paragraph should read, "during the time in which he is not engaged in maritime travel."

PUBLIC HEALTH ENGINEERING ABSTRACTS

Distribution and Succession of Protozoa in Imhoff Tanks. James B. Lackey. Report of sewage substation of the New Jersey Agricultural Experiment Station for year ending June 30, 1926, pp. 506-520.

A study to determine how and why protozoa are distributed throughout the depth of Imhoff tanks. Six diagrams and three tables present numerical data.

"(1) Flagellates are far more numerous than ciliates in Imhoff tanks; (2) vertically, flagellates are present in maximum numbers usually between 5 and 7 feet; (3) there is no definitely located point for the ciliate maximum; it varies greatly; (4) there is as yet no proof of a well-defined seasonal succession for any of the protozoa; (5) tanks which are not foaming have relatively small protozoan populations; (6) the numbers of protozoa decrease to the point of defaunation in tanks which are shut off; conversely, they increase enormously if a tank runs indefinitely; (7) their numbers are independent of observed ranges of pH and temperature in the tanks; (8) they are largely saprophytic forms, so a continuously running tank offers a constant food supply for them; (9) there is an absolute correlation between large increases in their numbers and foaming; (10) no definite explanation is at hand for the part they play in foaming."

But an increase in protozoa marks a danger point for the tank, and "if their increase be noted, the tank should be shut off or, better, corrected with lime."

English View of Sewage Disposal. Anon. *Public Works*, vol. 58, No. 10, October, 1927, pp. 400–402. (Abstract by W. J. Downer.)

Compares present status of dilution, irrigation, contact beds, percolating filters, activated sludge, tank treatment, and sludge disposal. Operation and advantages of each are briefly described.

Activated sludge treated more fully. Dilution is an authenticated method when sewage volume is reasonably apportioned to volume of diluent, salt or fresh. The Royal Commission has stated that 1 cubic yard of medium used in form of percolating filters is capable of performing same duty as 2 cubic yards of medium used in form of contact beds. Lagooning has taken the place of

pressing in English practice to a large extent and is far from ideal as regards smell nuisance.

Research on the Composition of the Gray Slimy Growth on the Surface of Sewage Filters. H. D. Bell. (*Surveyor*, 1926, v. 70, 561–565. Abstract by W. Rushton in the *Bulletin of Hygiene*, vol. 2, No. 7, July, 1927, pp. 546–547.

"The author describes attempts to isolate the various mixed growths of organisms which make up the flora of the gray slime of sewage filters and to investigate their relationships to the insect *Achorutus viaticus*.

"By the use of dilute solutions of copper sulphate and formalin it was found that two types of fungi and two types of bacteria were the principal living forms, namely: *Oidium lactis*, a mold; *Torula rosea*, a pink wild yeast; *Bacillus subtilis* and *Bacillus coli communis*.

"In 1922 a slimy growth was found on the walls of a cellar in which food, beer, etc., had been stored, and thriving on this growth types of the insect *Achorutus viaticus* were found. In general appearance this growth resembled the sewage filter growths except in color.

"Isolation of the growths showed—

Slimy growths from Barnsley sewage	Slimy growths from Ripon cellar
Torula rosea (wild yeast).	*Torula rosea.*
Mucor mucedo (mold).	*Mucor rouxii* (mold).
Oidium lactis (mold).	*Oidium lactis.*
Penicillium (mold).	*Penicillium glaucum* (mold).
Bacillus coli communis.	

"The growth from the Ripon cellar had no contact with sewage, yet it contained two organisms in common with sewage, viz, *Oidium lactis* and *Torula rosea.*

"The molds produce hyphal threads and spores, and *Torula rosea* has a somewhat similar structure in media containing carbohydrates.

"As *Schorutus viaticus* thrived equally well on both sewage and cellar growths it would appear that their food was the filamentous structures of the molds *O. lactis* and *Mucor* and *Penicillium.*

"The author suggests a theory as to the formation of the gray slimy growths, showing how the sticky fluid having attached a mold to a piece of solid matter such as filter media, offers a surface upon which another film of tank effluent may rest, and so accelerate the production of more molds from spores, thus forming a network of molds which prevents free aeration, and encourages anærobic growths, causing the surface to become foul. This is what is known as the beginning of clogging. As *Achorutus viaticus* is unable to live under the surface of a liquor, nor in the absence of air, it must either attack the molds or the slimy growths formed below, and prevent the formation of spores, or it must walk on the surface of the liquor and attack the hyphal threads with attached spores. Probably it does both, and in doing so aids in opening up the filter surface, thus restarting the free circulation of air by which the oxidizing and nitrifying organisms can propagate at a greater rate.

"The effect of this action is borne out by the increase of nitric nitrogen and suspended matter from a filter after colonization by *Achorutus.*

"If this theory is correct, it explains why a sewage filter is kept clean by means of the insect named, and also why a sewage filter will eventually 'pond,' even in the presence of the insect if an excessive amount of tank effluent is sprayed on the filter without suitable resting periods.

"Proof of the food of the insect was demonstrated by feeding it on pure cultures of the molds *O. lactis*, *M. mucedo*, *M. rouxii* and *Penicillium*, when it was seen that it lives at the expense of the mycelium of the molds.

"Since the author published his paper on The Maintenance of Clean Filtering Media on Sewage Filters (Assn. Managers Sewage Disposal, Leeds, Nov. 12, 1921) he has sent boxes of media containing eggs of the insect to nearly 40 sewage installations, including many abroad, some of which had to withstand tropical conditions and others extreme cold. On nearly 20 sewage installations in this country the insect has appeared naturally, and on these works ponding has scarcely been seen; this is attributed to its activities.

"The author desires information from sewage-disposal works where the insect is present naturally or introduced, (*a*) whether the insects are doing good work, (*b*) whether they appeared naturally or were introduced, (*c*) whether their colonization has been attempted and found successful.

"In conclusion, the author affirms that the interlacing hyphæ of *O. lactis*, the *Mucors* and probably other fungi is the probable origin of the gray, slimy growth of sewage filters, that the insect *Achorutus viaticus* feeds on it, and that neither copper sulphate 1–50,000 nor formalin 1–100,000 sprayed on the surface will prevent the formation of the gray, slimy growths on filters where the insect named has failed to colonize.

"In discussion, some speakers confirmed in all respects the usefulness of *Achorutus;* one pointed out that the winter period is the time when the slimy deposits are most prolific, suggesting a temperature factor. Others associated the slimy growth rather with bacterial activity than fungal, i. e., a bacterial factor as the dominant one. Attention was drawn to the Report of the Royal Commission on Sewage Disposal, where some of the workers tried various chemical ingredients, such as quicklime, chloros, and reported that caustic soda removed the growths.

"In reply the author stated his investigations had been confined to two or three works where the trade wastes had not been large, and it was possible other growths might appear at other sewage works."

Digestion of Activated Sludge. W. Rudolfs and P. J. A. Zellar. *Public Works*, vol. 18, No. 7, July, 1927, pp. 253–255. (Abstract by H. H. Hasson.)

This article is a summary of experiments on the effect of seeding activated sludge with ripe Imhoff sludge, mixing ripe sludge and fresh solids with it in proportion to secure most rapid digestion, and the effect of reaction control on digestion. Mixtures of ripe sludge and fresh solids, ripe sludge, fresh solids and activated sludge, ripe sludge and activated sludge, and activated sludge alone were used. Regular analyses (detailed description of method to be published later) of solids and ash and pH determinations were made. Bacterial and protozoan numbers were obtained and gas production of all materials was measured and analyzed.

The conclusions reached were that the activated sludge digests most rapidly when seeded with proper amounts of ripe sludge; that properly seeded activated sludge digests more rapidly and with less odors than properly seeded fresh solids; and that if gasification be desired properly seeded activated sludge should be treated with hydrated lime to a pH value of 7.5 to 7.6 (when necessary).

Effect of Lime on Sludge Digestion. W. Rudolfs, H. Heukelekian, P. J. A. Zeller, D. Peterson, J. R. Downes. Report of the Sewage Substation of the New Jersey Agricultural Experiment Station, year ending June 30, 1926, pp. 412–498. (Abstract by W. M. Olson.)

Presents detailed results of exhaustive research to determine the effect of lime under different conditions prevailing during digestion. Thirty-eight figures show 230 series of observed relations. Thirteen tables of data are given.

The report describes experiments with a series of bottles in the laboratory, with three Imhoff tanks in operation and at rest, and with a separate sludge-digestion tank. In each case methods and results (chemical, bacteriological, and zoological) are stated, followed by a discussion and summary. The amounts of lime necessary for the adjustment of fresh solids and other material in digestion tanks are discussed at some length, previous to the concluding general discussion of the study as a whole.

The laboratory work showed that lime has a pronounced effect upon sludge digestion, influencing the flora and fauna and consequently the chemical intermediate and end products. "Most rapid and satisfactory digestion proceeds at pH values of 7.3 to 7.8. If the reaction of incoming fresh solids is kept at pH 7.3 to 7.6, odors are practically absent." In a previous report (*American Journal of Public Health,* 16: 365–368) it was stated that digestion takes a normal course when two parts of dry fresh solids are added daily to 98 parts of ripe sludge (dry basis). With the use of lime to adjust the pH values of incoming fresh solids to 7.3 to 7.6, the above mentioned ratio may be increased from 2.0 to 3.5 or possibly 5 per cent, reducing greatly the volume of ripe sludge necessary for efficient digestion. Using the ratio of 2 parts fresh solids to 98 parts ripe sludge, "unadjusted but properly seeded material requires a per capita digestion space (in summer) of not less than 2.6 to 2.7 cubic feet. With reaction control * * * this * * * capacity can be reduced to 1.4 to 1.5 cubic feet."

In the plant experiments, "A comparison of two Imhoff tanks, one treated with lime to adjust the reaction of its contents, and the other untreated, showed that the treated tank gave no sign of foaming and was free from scum for several months in spite of the fact that it was continuously operating, whereas the untreated tank had to rest and could not be put into operation for a long time on account of heavy foaming."

On account of special conditions prevailing at the treatment plant it was not possible to carry the experiments on the separate sludge-digestion tank far enough to determine the maximum load which the tank could handle. With reaction control and the application of heat toward the end of the test, the tank provided satisfactory digestion in winter of 2.3 per cent fresh solids (dry basis) daily. The practicability of maintaining a comparatively high temperature in a sludge-digestion tank was demonstrated. The separate sludge-digestion tank did as well as a good working Imhoff tank. "Whether Imhoff tanks or separate sludge-digestion tanks are to be used depends upon the cost (construction and operating) and upon their flexibility and their ease of control." The control of the reaction of the contents and of the daily addition of definite quantities of fresh solids is simpler in separate sludge-digestion tanks than in Imhoff tanks. Likewise it is easier to heat a separate sludge-digestion tank.

"Figures and curves are presented to show the amounts of lime necessary to adjust the reaction of incoming fresh solids of different concentration. Examples are given for correction of poorly working, acid tanks. The reasons for adjustment are briefly discussed. Lime, if needed, should be added daily * * *. Examples of adjustment and methods of application of lime are given. The amount of lime necessary to adjust Plainfield fresh sewage solids to pH 7.3 is from 3 to 4 pounds per million gallons sewage daily; to adjust them to a pH value of 7.6 about 25 pounds per million gallons daily. * * * Good results in the correction of an Imhoff tank were obtained by adding dry hydrated lime to the digestion compartment with the aid of a small pump * * *. Material was pumped out of one compartment into the other and lime added. * * * With increased hardness of water the rate of sludge digestion should increase."

"Summarizing the discussion on the effect of lime on digestion we can state that probably several factors are of more or less importance: (a) Its effect on the activities of microorganism; (b) chemical reactions induced; (c) cause of change in physical conditions of digesting material.

"The effect on the activities of microorganisms may be: (1) Making the medium more favorable for acid producing organisms; (2) inducing the establishment of a predominantly different flora; (3) making the medium less (or more) favorable for protozoa.

"Chemically it affects the organic and mineral acids and under certain circumstances favors the liberation of ammonia.

"Physically it flocculates the finely divided materials (hydrophyllic colloids) changing the viscosity and affects the surface tension of the liquid."

Bushy, Hertz, Sewerage and Sewage Disposal. Anon. *Surveyor*, vol. 72, No. 1867, November 4, 1927, p. 406. (Abstract by J. B. Harrington.)

This is a brief article describing the sewage-disposal plant for the urban district of Bushy, present population 12,743. All sewage, with the exception of a small area flows by gravity to the purification works located on a 31½-acre tract of land in the district of Watford.

Previous treatment of sewage consisted of chemical precipitation and downward filtration through 5 acres of land. Unsatisfactory results by this method were responsible for the construction in 1910 of a more modern plant comprising the following units: Duplicate grit and screening chambers, two sedimentation tanks 28 feet in diameter by 14 feet deep, four rectangular sedimentation tanks 40½ by 35 by 4½ feet, one dosing chamber with two automatic siphons, two sludge tanks 17½ by 15 by 15 feet, five trickling filters 90 feet in diameter by 5 feet deep, six sand filters, combined area 2,300 square yards, and two rectangular storm-water tanks 80 by 22 feet by 2 feet 9 inches.

Increased population made it necessary to provide the following minor changes: Two new grit and screening chambers, remodeling of one circular sedimentation tank, construction of an octagonal humus tank 25 feet in diameter by 24 feet 2 inches deep, between the trickling filters and sand filters, and three new sludge digestion tanks and five sludge drying beds.

The construction of the supplementary units makes it possible to deliver practically an odorless effluent and sludge.

Production of Illuminating Gas from the Stuttgart Sewage Filter Plant. W. Sohler, *Gas. u. Wasserfach*, 70, 945–9 (1927). Abstract by R. W. Ryan in *Chemical Abstracts*, vol. 21, No. 22, Part I, November 20, 1927, p. 4000.

"A daily gas production of 3,000 to 4,000 cubic meters of gas is obtained from the anærobic fermentation of sludge from the Stuttgart sewage (population of Stuttgart, 350,000). The gas analyzes about 12 to 20 per cent CO_2, 4.8 per cent H_2, 75.5 per cent CH_4, and 4.7 per cent N_2, and has a calorific value of 7,500 to 8,500 cal. per cu. m. The method of recovery of this gas is described and illustrated. The gas is sold to the Gaisburg gas works."

The Aluminate-Alum Coagulation of Water. C. H. Christman. Bulletin 18–A, issued by the Chicago Chemical Co. 6 pages. (Abstract by W. A. Hardenbergh.)

Alum has been used almost universally as a coagulent in water purification, but its use with certain waters or under certain conditions has not been satisfactory. In some waters in the Great Lakes region, 0.2 to 0.4 grains per gallon is an efficient dose, but some plants in other sections require as much as 5 or 6 grains per gallon. Studies of these phenomena have shown that colloidal waters do not yield readily to treatment by alum. The application of hydrogen-ion

control resulted in great advances, but the principles of colloid chemistry, it is felt, will yield still further advances.

Many workers have sought a coagulant that would meet the conditions required by their water supply, and also yield an effluent of sufficient alkalinity to be noncorrosive. Sodium aluminate therefore came into use, but was not entirely satisfactory, until a certain type of the chemical, itself possessing colloidal properties, was used. Further research is now going on. An account of the results at several plants is given.

Ueber die Abwasserreinigung mit Aktiviertem Schlamm Nach Versuchen mit Muenchener Kanalwasser. (Experiments with activated sludge, etc.) M. Strell. *Gesundheits-Ingenieur.* 1927, vol. 50, pp. 179–182. Abstract by M. E. Delafield in the *Bulletin of Hygiene*, vol. 2, No. 7, July, 1927, pp. 549–550.

"This is in the main a description of certain experiments with the activated sludge process. It is maintained that the mode of action is only to a slight extent a physical one and that by far the greatest part is a biological action brought about by bacteria, protozoa, and metazoa. In activated sludge it is possible to demonstrate the existence of such enzymes as diastase, invertase, glycogenase, maltase, lipase, pepsin, trypsin, urease, oxydase, and katalase. The experiments consisted in determining the variation in the purification of crude sewage resulting from varying the time and the amount of aeration, and the proportion of added sludge.

"The general conclusions reached were: (1) That the addition of about one-third of activated sludge was the most effective; (2) that the greatest purification occurred in the first hour and was about 60 to 70 per cent; (3) provided there is sufficient aeration to keep the sludge in movement, further increasing the amount of air does not improve the purification materially; (4) too great an aeration has the effect of breaking up still further the sludge particles and so producing a turbid effluent containing more suspended matter."

Residential Sewage Treatment Plants. Lindon J. Murphy. Bulletin 93, Iowa State College of Agriculture and Mechanic Arts Official Publication, vol. 25, No. 70, May 28, 1927. 23 pages. (Abstract by W. L. Havens.)

This article summarizes the essential design and construction details of house plumbing, grease traps, house sewers, cesspools, Imhoff tanks, septic tanks, subsurface irrigation, trickling filters and intermittent sand filters as applied to sewerage facilities for residences and small communities. Sketches of the various devices are given, together with methods of construction and methods of estimating the costs of the different systems. Basic features of design and general operating suggestions are also given. The article should be of particular interest to those who contemplate the installation of small residential plants and who depend upon a carpenter contractor for engineering advice.

MORTALITY SUMMARY FOR 75 LARGE CITIES, 1927

Number of deaths, death rates, and infant mortality in 75 large cities of the United States for 1927 and comparison with 1926

[From the Weekly Health Index, Bureau of the Census, Department of Commerce]

City[1]	Total deaths[2]	Death rate[3]	Deaths under 1 year[2]	Provisional infant mortality rate, 1927[3, 4]	Infant mortality rate, 1926	Mortality data for calendar year, 1926[5] Total deaths	Death rate	Deaths under 1 year
Total (67 cities)	363,799	12.3	39,054	[6] 62	[6] 72	384,746	13.2	45,727
Akron [7]	1,906	--------	283	59	82	2,060	--------	392
Albany	1,905	16.0	168	66	61	1,989	16.8	152
Atlanta [8]	3,793	15.3	473	--------	--------	3,907	16.0	543
White	1,976	11.3	207	--------	--------	1,901	11.1	262
Colored	1,817	24.7	266	--------	--------	2,006	27.6	281
Baltimore	11,535	14.1	1,330	81	83	12,210	15.1	1,359
White	8,583	12.3	894	68	71	9,220	13.4	932
Colored	2,952	24.6	436	131	128	2,990	25.1	427
Birmingham	3,405	15.7	450	74	--------	3,718	17.7	537
White	1,575	11.9	197	52	--------	1,731	13.5	239
Colored	1,830	21.7	253	109	--------	1,987	24.0	298
Boston	11,006	13.9	1,449	77	84	11,720	14.9	1,573
Bridgeport [7]	1,505	--------	132	46	73	1,692	--------	223
Buffalo	7,275	13.3	836	69	84	7,779	14.3	1,037
Cambridge	1,385	11.2	156	53	68	1,481	12.1	199
Camden	1,634	12.3	220	67	87	1,768	13.5	264
Canton	1,109	9.8	147	67	91	1,141	10.4	197
Chicago	35,582	11.5	3,813	63	67	35,625	11.7	4,005
Cincinnati	6,887	16.8	646	75	89	7,104	17.3	764
Cleveland	9,463	9.8	1,043	54	72	10,640	11.1	1,396
Columbus	3,886	13.4	352	63	75	3,968	13.9	424
Dallas [8]	2,411	11.4	318	--------	--------	2,730	13.5	440
White	1,880	10.2	269	--------	--------	2,104	11.9	358
Colored	531	19.4	49	--------	--------	626	23.4	82
Dayton	2,210	12.3	231	73	84	2,162	12.2	264
Denver [8]	4,187	14.5	403	--------	--------	3,963	13.9	385
Des Moines	1,586	10.7	131	42	68	1,716	11.8	202
Detroit	14,393	10.8	2,323	69	84	16,229	12.6	2,875
Duluth	1,122	9.8	97	43	59	1,195	10.6	142
El Paso [8]	1,610	14.2	293	--------	--------	1,762	16.1	372
Erie [7]	1,269	--------	132	52	89	1,509	--------	218
Fall River	1,431	10.8	222	73	91	1,707	13.0	277
Flint	1,389	9.8	311	76	85	1,295	9.5	280
Fort Worth [8]	1,752	10.7	188	--------	--------	1,551	9.7	202
White	1,399	9.7	161	--------	--------	1,260	9.0	169
Colored	353	18.1	27	--------	--------	291	15.1	33
Grand Rapids	1,587	9.8	190	54	66	1,773	11.3	235
Houston [7, 8]	2,957	--------	353	--------	--------	2,881	--------	336
White	1,954	--------	253	--------	--------	1,929	--------	229
Colored	1,003	--------	100	--------	--------	952	--------	107
Indianapolis	4,900	13.1	414	61	77	5,146	14.0	527
White	4,101	12.5	329	55	70	4,331	13.4	421
Colored	799	17.9	85	99	123	815	18.7	106
Jersey City	3,541	11.0	425	61	67	3,802	11.9	463
Kansas City, Kans.	1,533	13.1	162	66	84	1,590	13.6	209
White	1,136	11.8	110	52	78	1,210	12.6	165
Colored	397	18.8	52	145	122	380	18.5	44
Kansas City, Mo.	4,994	13.1	448	61	--------	5,137	13.7	578
Knoxville	1,470	14.4	156	65	--------	1,423	14.4	185
White	1,144	12.8	128	59	--------	1,062	12.2	144
Colored	326	26.8	28	115	--------	361	29.8	41
Los Angeles [7]	12,926	--------	1,186	65	59	12,222	--------	1,083
Lowell	1,394	12.7	216	87	89	1,549	14.0	220
Lynn	1,137	10.9	119	58	66	1,178	11.3	125
Memphis	3,444	19.3	347	78	--------	3,529	20.0	416
White	1,738	15.1	168	60	--------	1,737	15.3	199
Colored	1,706	27.0	179	108	--------	1,792	28.4	217

[1] For the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

[2] Based upon telegraphic reports received each week from city health officers.

[3] Allowance has been made for the extra day which must be added to the 52 weeks to give a period of 365 days.

[4] Infant mortality rate is based upon deaths under 1 year as returned each week and estimated births, 1927.

[5] Based upon deaths which occurred within the calendar year.

[6] Infant mortality rate for the cities in the birth registration area appearing in the summary.

[7] Mortality rates are omitted, pending the establishment of more satisfactory estimates of population.

[8] Cities with no infant mortality rate are not in the registration area for births.

Number of deaths, death rates, and infant mortality in 75 large cities of the United States for 1927 and comparison with 1926—Continued

[From the Weekly Health Index, Bureau of the Census, Department of Commerce]

City	Total deaths	Death rate	Deaths under 1 year	Provisional infant mortality rate, 1927	Infant mortality rate, 1926	Mortality data for calendar year, 1926: Total deaths	Death rate	Deaths under 1 year
Milwaukee	5,706	10.7	770	66	75	5,730	11.1	856
Minneapolis	4,702	10.5	377	43	56	5,002	11.5	518
Nashville	2,406	17.5	221	67	--------	2,698	19.7	337
White	1,450	14.8	137	56	--------	1,566	16.0	217
Colored	946	24.4	84	97	--------	1,132	29.0	120
New Bedford	1,303	10.9	161	67	102	1,500	12.5	283
New Haven	2,028	11.0	178	48	54	2,212	12.2	200
New Orleans	7,917	18.7	918	85	--------	7,933	18.0	808
White	4,641	14.8	450	63	--------	4,656	15.0	411
Colored	3,276	29.8	468	130	--------	3,277	30.0	397
New York	70,243	11.8	7,254	56	68	76,065	12.8	8,480
Bronx Borough	8,574	9.3	694	40	78	9,244	10.3	947
Brooklyn Borough	23,763	10.5	2,856	55	66	26,930	12.0	3,282
Manhattan Borough	29,075	10.1	2,923	66	72	30,068	16.0	3,157
Queens Borough	6,736	8.3	633	49	75	7,833	10.3	894
Richmond Borough	2,096	14.3	148	51	72	1,990	14.0	200
Newark, N. J.	5,081	11.2	602	59	70	5,464	11.9	737
Oakland	2,952	11.1	260	54	63	2,802	10.8	277
Oklahoma City [7, 8]	1,509	--------	169	--------	--------	1,186	--------	134
Omaha	2,670	12.2	237	53	64	2,704	13.0	295
Paterson	1,729	12.1	162	54	64	1,830	12.8	187
Philadelphia	24,811	12.2	2,405	64	78	27,667	13.8	3,007
Pittsburgh	9,055	13.6	1,147	72	82	9,001	14.1	1,234
Portland, Oreg.[7]	3,516	--------	205	42	39	3,377	--------	189
Providence	3,165	11.3	379	63	69	3,544	12.9	416
Richmond	2,699	14.1	274	69	107	3,005	16.0	430
White	1,559	11.5	133	52	76	1,711	12.8	197
Colored	1,140	20.6	141	99	164	1,324	23.9	233
Rochester	3,755	11.6	405	63	67	4,103	12.8	414
St. Louis	10,817	12.9	817	52	--------	11,540	13.9	1,146
St. Paul	2,812	11.3	195	36	56	3,052	12.3	318
Salt Lake City	1,654	12.2	195	61	66	1,703	12.8	217
San Antonio [8]	2,978	14.1	522	--------	--------	3,015	14.7	606
San Diego	2,074	18.0	160	58	46	1,840	16.7	108
San Francisco	7,907	13.8	390	47	50	7,662	13.5	415
Schenectady	984	10.6	111	67	71	1,087	11.7	124
Seattle	3,538	9.5	187	37	47	3,564	9.7	228
Somerville	929	9.2	96	64	61	1,081	10.8	110
Springfield, Mass.	1,663	11.3	170	52	69	1,820	12.6	229
Syracuse	2,394	12.2	243	57	60	2,513	13.6	277
Toledo	3,631	11.9	335	62	82	3,733	12.6	448
Trenton	1,927	14.1	226	73	77	1,890	14.1	228
Utica	1,578	15.3	130	56	81	1,681	16.4	182
Washington, D. C.	6,964	12.9	605	66	85	7,388	14.0	758
White	4,332	10.8	305	48	67	4,583	11.6	407
Colored	2,632	19.4	300	106	123	2,805	21.0	351
Waterbury [7]	1,021	--------	118	66	82	1,194	--------	182
Wilmington, Del.	1,446	11.5	145	73	87	1,615	13.0	183
Worcester	2,504	12.8	245	57	75	2,701	14.0	322
Yonkers	1,106	9.3	138	60	75	1,215	10.4	170
Youngstown	1,716	10.2	257	66	85	1,770	10.7	332

[7] Mortality rates are omitted, pending the establishment of more satisfactory estimates of population.
[8] Cities with no infant mortality rate are not in the registration area for births.

DEATHS DURING WEEK ENDED DECEMBER 31, 1927

Summary of information received by telegraph from industrial insurance companies for the week ended December 31, 1927, and corresponding week of 1926. (From the Weekly Health Index, January 7, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Dec. 31, 1927	Corresponding week, 1926
Policies in force	69,653,164	66,378,884
Number of death claims	14,773	13,103
Death claims per 1,000 policies in force, annual rate	11.1	10.3

Deaths from all causes in certain large cities of the United States during the week ended December 31, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926. (From the Weekly Health Index, January 7, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Dec. 31, 1927		Annual death rate per 1,000 corresponding week, 1926	Deaths under 1 year		Infant mortality rate, week ended Dec. 31, 1927 [2]
	Total deaths	Death rate [1]		Week ended Dec 31, 1927	Corresponding week, 1926	
Total (68 cities)	7,917	13.8	[3] 14.2	786	[3] 813	[4] 67
Akron	29	--------	--------	6	6	65
Albany [5]	47	20.5	18.0	3	4	63
Atlanta [6]	88	18.4	15.6	10	8	--------
White	53	15.8	12.8	3	5	--------
Colored	35	24.7	22.2	7	3	--------
Baltimore [5, 6]	234	14.9	17.8	25	33	79
White	171	12.8	15.0	15	21	60
Colored	63	27.3	33.7	10	12	156
Birmingham [6]	90	21.6	21.0	9	12	--------
White	40	15.7	15.5	4	7	--------
Colored	50	30.8	29.6	5	5	--------
Boston	223	14.7	16.9	28	30	78
Bridgeport	43	--------	--------	7	4	119
Buffalo	143	13.6	12.2	13	11	55
Cambridge	38	16.0	14.5	3	4	53
Camden	33	12.9	11.6	4	2	68
Canton	25	11.5	12.3	2	3	48
Chicago [5]	773	13.0	13.0	81	73	70
Cincinnati	149	18.8	17.8	10	13	60
Cleveland	220	11.8	11.1	26	22	70
Columbus	90	16.1	15.9	3	7	28
Dallas [6]	71	17.5	13.1	5	9	--------
White	56	15.9	12.4	5	8	--------
Colored	15	28.5	17.6	0	1	--------
Dayton	36	10.4	12.7	6	5	99
Denver	105	18.9	15.9	9	9	--------
Des Moines	32	11.2	12.9	4	7	71
Detroit	283	11.1	12.6	35	62	54
Duluth	29	13.2	15.7	1	2	22
El Paso	42	19.3	12.9	5	3	--------
Erie	20	--------	--------	3	4	64
Fall River [5]	29	11.4	12.3	5	12	85
Flint	42	15.3	9.2	7	4	110
Fort Worth [6]	35	11.2	11.8	3	2	--------
White	26	9.4	9.3	3	0	--------
Colored	9	23.9	29.7	0	2	--------
Grand Rapids	35	11.3	11.7	4	5	59
Houston [6]	70	--------	--------	9	5	--------
White	50	--------	--------	8	4	--------
Colored	20	--------	--------	1	1	--------
Indianapolis [6]	100	13.9	15.1	11	6	84
White	82	13.0	14.8	10	5	87
Colored	18	21.0	16.8	1	1	60
Jersey City	66	10.7	12.1	10	11	75
Kansas City, Kans. [6]	25	11.1	10.7	3	5	63
White	18	9.7	10.3	2	4	49
Colored	7	17.2	12.7	1	1	145
Kansas City, Mo	128	17.4	18.2	3	12	--------
Knoxville [6]	23	11.7	--------	2	--------	--------
White	14	8.1	--------	1	--------	--------
Colored	9	38.5	--------	1	--------	--------
Los Angeles	306	--------	--------	34	23	97
Lowell	38	18.0	13.7	3	3	63
Lynn	27	13.4	16.5	2	4	55
Memphis [6]	65	18.9	20.1	5	9	--------
White	30	13.5	14.7	1	2	--------
Colored	35	28.8	29.7	4	7	--------
Milwaukee	111	10.8	12.3	18	14	83
Minneapolis	120	14.0	10.7	11	7	62
Nashville [6]	58	21.9	15.6	9	4	--------
White	42	22.1	12.2	9	3	--------
Colored	16	21.4	24.1	0	1	--------
New Bedford	35	15.3	11.3	4	4	76
New Haven	31	8.7	14.0	4	3	56
New Orleans [6]	216	26.5	17.9	18	7	--------
White	142	23.6	15.8	14	2	--------
Colored	74	35.0	25.3	4	5	--------

(See footnotes at end of table.)

Deaths from all causes in certain large cities of the United States during the week ended December 31, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926. (From the Weekly Health Index, January 7, 1928, issued by the Bureau of the Census, Department of Commerce)—**Contd.**

City	Week ended Dec. 31, 1927		Annual death rate per 1,000 corresponding week, 1926	Deaths under 1 year		Infant mortality rate, week ended Dec. 31, 1927
	Total deaths	Death rate		Week ended Dec. 31, 1927	Corresponding week, 1926	
New York	1,514	13.2	14.1	150	160	63
Bronx boro	191	10.8	12.3	20	17	64
Brooklyn boro	473	10.8	13.2	56	58	58
Manhattan boro	654	18.8	17.4	55	64	66
Queens boro	148	9.5	10.6	16	17	70
Richmond boro	48	17.1	14.6	3	4	57
Newark, N. J	94	10.5	11.9	14	15	70
Oakland	74	14.4	16.8	9	8	106
Oklahoma City	27			1	2	
Omaha	60	14.3	11.9	12	3	136
Paterson	27	9.8	10.6	2	0	36
Philadelphia	498	12.8	14.8	47	51	63
Pittsburgh	216	16.9	16.5	25	17	87
Portland, Oreg	80			2	6	21
Providence	70	13.0	9.3	6	4	52
Richmond [6]	56	15.2	18.2	5	4	65
White	31	11.9	14.4	3	2	61
Colored	25	23.4	27.3	2	2	73
Rochester	65	10.4	12.0	6	5	51
St. Louis	251	[illegible]	16.9	17	22	
St Paul	52	10.8	13.2	2	7	18
Salt Lake City [5]	45	17.8	14.5	4	3	64
San Antonio	78	19.2	15.0	12	8	
San Diego	48	21.7	21.7	6	4	182
San Francisco	166	15.0	15.9	10	6	62
Schenectady	14	7.8	10.1	2	3	60
Seattle	76	10.6	13.2	5	6	53
Somerville	25	12.8	15.1	3	4	87
Springfield, Mass	38	13.4	15.1	5	4	79
Syracuse	44	11.6	13.8	4	4	52
Tacoma	20	9.7	12.3	1	1	23
Toledo	83	14.2	11.8	4	4	38
Trenton	47	17.9	13.6	4	5	71
Utica	36	18.2	17.3	0	3	0
Washington, D. C.[6]	142	13.7	13.6	15	11	88
White	81	10.5	11.8	3	3	26
Colored	61	23.4	19.1	12	8	219
Waterbury	28			3	4	70
Wilmington, Del	33	13.6	13.0	1	4	25
Worcestor	42	11.2	12.1	4	6	48
Yonkers	26	11.4	11.7	4	4	92
Youngstown	42	12.9	14.6	3	11	40

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 67 cities.
[4] Data for 61 cities.
[5] Deaths for week ended Friday, Dec. 30, 1927.
[6] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

DEATHS DURING WEEK ENDED JANUARY 7, 1928

Summary of information received by telegraph from industrial insurance companies for week ended January 7, 1928, and corresponding week of 1927. (From the Weekly Health Index, January 12, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Jan. 7, 1928	Corresponding week, 1927
Policies in force	69,402,221	66,407,940
Number of death claims	9,325	11,467
Death claims per 1,000 policies in force, annual rate	7.0	9.0

Deaths from all causes in certain large cities of the United States during the week ended January 7, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, January 12, 1928, issued by the Bureau of the Census, Department of Commerce).

City	Week ended Jan. 7, 1928: Total deaths	Week ended Jan. 7, 1928: Death rate [1]	Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year: Week ended Jan. 7, 1928	Deaths under 1 year: Corresponding week, 1927	Infant mortality rate, week ended Jan. 7, 1928 [2]
Total (66 cities)	7,862	13.7	[3] 14.7	762	[3] 895	[4] 63
Akron	36			8	10	87
Albany [5]	35	15.2	20.1	2	3	41
Atlanta	77	15.9	19.5	11	11	
White	45		14.0	5	4	
Colored	32	(6)	32.5	6	7	
Baltimore [5]	253	15.9	17.0	24	37	76
White	195		14.9	14	21	56
Colored	58	(6)	29.4	10	16	157
Birmingham	87	20.5	19.4	12	12	103
White	41		14.9	7	5	97
Colored	46	(6)	26.5	5	7	113
Boston	237	15.5	14.9	25	22	69
Bridgeport	37			3	6	55
Buffalo	168	15.8	24.4	17	30	73
Cambridge	33	13.7	16.8	6	6	107
Camden	25	9.7	12.5	3	3	48
Canton	17	7.6	6.0	0	1	0
Chicago [5]	810	13.4	14.5	65	92	56
Cincinnati	128	16.2	20.2	6	17	36
Cleveland	154	8.0	11.4	17	24	46
Columbus	86	15.1	12.9	4	7	37
Dallas	57	13.7	13.8	10	4	
White	43		11.8	8	3	
Colored	14	(6)	26.6	2	1	
Dayton	27	7.7	15.6	5	4	83
Denver	81	14.4	18.7	6	8	
Des Moines	29	10.0	8.8	3	4	50
Detroit	318	12.1	13.9	56	70	86
Duluth	13	5.8	6.8	1	2	23
El Paso	35	15.5	23.4	7	11	
Erie	14			2	2	41
Fall River [5]	31	12.1	9.4	2	5	34
Flint	15	5.3	10.6	4	7	51
Fort Worth	44	13.7	13.1	5	4	
White	34		12.7	3	4	
Colored	10	(6)	16.0	2	0	
Grand Rapids	34	10.8	10.6	4	1	60
Houston	53			5	9	
White	45			5	6	
Colored	8	(6)		0	3	
Indianapolis	110	15.1	14.5	8	16	61
White	93		14.1	7	13	61
Colored	17	(6)	17.5	1	3	61
Jersey City	83	13.4	13.0	8	9	60
Kansas City, Mo	84	11.2	13.9	6	17	42
Knoxville	17	8.4	12.3	1	3	22
White	13		9.9	1	2	24
Colored	4	(6)	29.9	0	1	0
Los Angeles	313			31	23	89
Lowell	27	12.8	18.4	1	4	21
Lynn	34	16.9	16.9	1	4	25
Memphis	54	15.6	18.1	9	8	105
White	29		13.5	5	4	94
Colored	25	(6)	26.3	4	4	125
Milwaukee	125	12.0	10.9	19	26	85
Minneapolis	99	11.4	13.4	8	8	48
Nashville	53	20.0	22.3	6	6	94
White	29		17.4	5	5	107
Colored	24	(6)	34.9	1	1	60
New Bedford	32	14.0	14.4	4	3	87
New Haven	45	12.5	11.6	5	5	71
New Orleans	206	25.1	18.8	21	15	102
White	141		12.5	14	3	102
Colored	65	(6)	36.9	7	12	102

(See footnotes at end of table.)

Deaths from all causes in certain large cities of the United States during the week ended January 7, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, January 12, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Jan. 7, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Jan. 7, 1928
	Total deaths	Death rate		Week ended Jan. 7, 1928	Corresponding week, 1927	
New York	1,574	13.7	13.2	145	138	59
Bronx Borough	198	10.9	10.3	12	11	36
Brooklyn Borough	515	11.7	11.7	46	45	46
Manhattan Borough	650	19.4	17.8	66	67	78
Queens Borough	164	10.0	9.6	20	13	81
Richmond Borough	47	16.3	18.5	1	2	18
Newark, N. J	104	11.5	16.2	7	12	36
Oakland	68	13.0	16.6	7	2	76
Oklahoma City	34			5	1	
Omaha	58	13.6	16.7	6	4	70
Paterson	47	17.0	13.4	5	3	87
Philadelphia	551	14.0	13.7	49	60	66
Pittsburgh	192	14.9	18.4	28	29	92
Portland, Oreg	72			4	4	43
Providence	68	12.4	15.2	3	8	26
Richmond	67	18.0	15.2	6	4	78
White	38		13.8	4	4	81
Colored	29	(6)	18.8	2	0	73
Rochester	93	14.8	11.2	4	4	32
St. Louis	231	14.2	14.	20	18	67
St. Paul	82	17.0	13.1	8	1	77
Salt Lake City [5]	34	12.9	13.1	2	7	33
San Antonio	90	21.6	16.5	16	11	
San Diego	48	21.0	18.5	4	7	76
San Francisco	183	16.3	18.6	13	4	82
Schenectady	11	6.2	16.2	2	2	63
Somerville	30	15.3	10.8	4	3	138
Spokane	33	15.8	17.7	1	2	26
Springfield, Mass	27	9.4	14.5	3	7	48
Syracuse	52	13.6	16.1	4	8	49
Tacoma	26	12.3	15.6	2	2	51
Toledo	79	13.2	13.7	4	8	38
Trenton	44	16.6	19.1	7	8	119
Washington, D. C	148	14.0	15.9	5	15	29
White	81		13.3	1	10	8
Colored	67	(6)	23.7	4	5	74
Waterbury	18			3	3	87
Wilmington, Del	45	18.3	18.6	5	3	132
Worcester	63	16.7	15.2	6	5	73
Yonkers	21	9.1	9.7	2	2	46
Youngstown	30	9.0	13.2	2	9	27

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Date for 59 cities.
[4] Date for 66 cities.
[5] Deaths for week ended Friday, Jan. 6, 1928.
[6] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 15, 1927, and January 14, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 15, 1927, and January 14, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928
New England States:								
Maine	1	2	5	3	201	59	0	0
New Hampshire								
Vermont	2				91	2	0	0
Massachusetts	109	129	12	10	197	1,202	1	1
Rhode Island	16	17			2	5	0	0
Connecticut	31	44	24	3	17	112	2	0
Middle Atlantic States:								
New York	288	421	[1] 98	[1] 22	821	1,119	9	2
New Jersey	134	198	28	24	62	188	1	3
Pennsylvania	213	251			860	857	2	2
East North Central States:								
Ohio								
Indiana	65	47	139	33	90	87	0	0
Illinois	136	184	88	33	1,137	58	4	9
Michigan	139	109		9	91	354	0	1
Wisconsin	43	40	35	87	814	28	6	3
West North Central States:								
Minnesota	36	59	3	1	130	6	0	2
Iowa [2]	36				199		0	
Missouri	56	46	3	11	186	30	1	5
North Dakota	4	9			130	1	2	3
South Dakota				1	20	45	0	0
Nebraska	6	11	5		73	4	0	3
Kansas	17	32	22	10	137	25	2	7
South Atlantic States:								
Delaware	8	1	1	2	3	17	0	0
Maryland [2]	75	25	96	49	20	249	1	1
District of Columbia	20		10				0	
Virginia								
West Virginia	30	14	61	31	98	71	1	1
North Carolina	43	80			161	3,689	0	0
South Carolina	21	49	914	1,439	49	1,459	0	0
Georgia	32	23	107	184	56	173	0	0
Florida	30	28		11	6	7	0	1

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 15, 1927, and January 14, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928
East South Central States:								
Kentucky		13		8		51		0
Tennessee	39	17	83	141	136	445	1	0
Alabama	72	33	99	224	75	165	0	0
Mississippi	21	16					1	2
West South Central States:								
Arkansas	12	19	121	266	11	183	1	0
Louisiana	28	29	21	48	83	62	0	1
Oklahoma [3]	34	55	278	187	37	60	1	2
Texas	76	80	408	65	19	36	0	1
Mountain States:								
Montana	7	1			67	1	6	0
Idaho	2				77	2	0	0
Wyoming	5	1			66		3	7
Colorado	5	18	4		15	61	1	3
New Mexico		7				46		0
Arizona	4	35			7	27	0	1
Utah [1]	8	9		4	491		0	3
Nevada								
Pacific States:								
Washington	21	8		1	361	269	8	5
Oregon	19	14	23	23	55	46	5	0
California	152	129	41	34	1,537	96	3	9

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928
New England States:								
Maine	0	1	31	26	0	0	1	1
New Hampshire								
Vermont	0	0	3	0	0	0	0	0
Massachusetts	2	6	495	364	0	0	12	5
Rhode Island	0	0	14	38	0	0	1	1
Connecticut	0	0	101	112	0	53	1	3
Middle Atlantic States:								
New York	1	6	720	626	18	18	27	15
New Jersey	1	1	266	205	0	0	5	5
Pennsylvania	1	3	508	450	0	0	40	20
East North Central States:								
Ohio								
Indiana	0	1	210	115	129	125	3	2
Illinois	1	1	334	366	27	25	8	16
Michigan	0	2	395	306	45	49	11	9
Wisconsin	1	1	202	164	29	27	4	0
West North Central States:								
Minnesota	0	1	254	137	4	3	5	4
Iowa [1]	0		75		16		0	
Missouri	1	2	171	98	10	51	6	4
North Dakota	0	3	88	29	11	6	0	1
South Dakota	0	0	35	40	3	7	0	1
Nebraska	0	1	52	83	23	44	1	1
Kansas	1	4	134	192	40	125	8	1
South Atlantic States:								
Delaware	0	0	47	5	0	0	0	0
Maryland [1]	0	1	106	69	0	0	10	6
District of Columbia	0		32		0		0	
Virginia								
West Virginia	0	4	81	56	4	17	8	10
North Carolina	0	1	66	81	99	106	5	4
South Carolina	2	1	12	10	16	33	12	0
Georgia	0	0	24	24	71	0	4	9
Florida	2	0	16	14	40	10	15	[illegible]

[1] Week ended Friday. [3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 15, 1927, and January 14, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928	Week ended Jan. 15, 1927	Week ended Jan. 14, 1928
East South Central States:								
Kentucky		0		58		27		3
Tennessee	0	1	51	21	13	23	21	7
Alabama	0	0	18	16	78	4	7	12
Mississippi	0	0	14	20	9	7	2	5
West South Central States:								
Arkansas	0	0	8	26	4	9	11	3
Louisiana	1	1	8	11	7	11	8	11
Oklahoma [3]	0	1	61	41	39	201	11	7
Texas	0	2	76	90	406	78	10	6
Mountain States:								
Montana	0	0	141	35	6	27	0	0
Idaho	0	0	30	25	6	11	0	1
Wyoming	0	0	35	34	0	18	0	0
Colorado	0	2	67	151	9	18	0	0
New Mexico		0		9		0		1
Arizona	1	0	12	8	0	0	1	1
Utah [2]	0	0	17	17	3	33	0	0
Nevada								
Pacific States:								
Washington	0	6	116	54	61	70	4	4
Oregon	0	4	80	32	26	40	9	3
California	3	8	280	206	23	22	14	13

[2] Week ended Friday.

[3] Exclusive of Tulsa.

Reports for Week Ended January 7, 1928

DIPHTHERIA	Cases
District of Columbia	27
North Dakota	6

INFLUENZA	
District of Columbia	2
New Hampshire	56

MEASLES	
District of Columbia	3
New Hampshire	8

MENINGOCOCCUS MENINGITIS	Cases
North Dakota	1

POLIOMYELITIS	
New Hampshire	1

SCARLET FEVER	
District of Columbia	29
New Hampshire	12
North Dakota	48

SMALLPOX	
North Dakota	1

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October, 1927										
Pennsylvania	16	916			1,059		119	1,070	0	164
November, 1927										
California	21	747	98	9	,261	5	139	794	52	46
Hawaii Territory	5	17	7		17		1	2	0	8
Pennsylvania	9	1,187			1,735	1	70	1,626	0	132
South Dakota	1	25	7		70		19	191	13	13
December, 1927										
Arizona	5	41	1		18		1	11	2	10
Connecticut	1	196	51		193		5	302	0	6
Indiana	3	216	127		178		11	421	216	24

October, 1927

	Cases
Pennsylvania:	
Anthrax	1
Chicken pox	1,183
Dysentery (epidemic)	1
German measles	37
Impetigo contagiosa	59
Lead poisoning	2
Lethargic encephalitis	3
Mumps	545
Ophthalmia neonatorum	10
Tetanus	1
Trachoma	2
Whooping cough	551

November, 1927

	Cases
Anthrax:	
California	1
Pennsylvania	1
Chicken pox:	
California	1,346
Hawaii Territory	13
Pennsylvania	2,832
South Dakota	37
Conjunctivitis (follicular):	
Hawaii Territory	48
Dysentery:	
California (bacillary)	7
Hawaii Territory (amoebic)	1
German measles	
California	409
Pennsylvania	62
Lead poisoning:	
Pennsylvania	1
Leprosy:	
California	1
Hawaii Territory	5
Lethargic encephalitis:	
California	9
Pennsylvania	7
Mumps:	
California	348
Pennsylvania	1,292
South Dakota	21
Ophthalmia neonatorum:	
California	1
Pennsylvania	15
Paratyphoid fever:	
California	2
Puerperal fever:	
Pennsylvania	11
Rabies in animals:	
California	46
Rabies in man:	
California	1
Tetanus:	
California	5
Hawaii Territory	2
Pennsylvania	4
Trachoma:	
California	214
Hawaii Territory	43
South Dakota	2
Trichinosis:	
California	2
Tularaemia:	
California	1
Whooping cough:	
California	504
Hawaii Territory	1
Pennsylvania	711
South Dakota	20

December, 1927

	Cases
Chicken pox:	
Arizona	29
Connecticut	428
Indiana	322
Conjunctivitis (infectious):	
Connecticut	4
German measles:	
Connecticut	8
Lethargic encephalitis:	
Connecticut	1
Mumps:	
Arizona	22
Connecticut	146
Indiana	68
Rabies in animals:	
Connecticut	5
Septic sore throat:	
Connecticut	10
Trachoma:	
Arizona	14
Whooping cough:	
Arizona	6
Connecticut	470
Indiana	77

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 97 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,500,000. The estimated population of the 93 cities reporting deaths is more than 29,900,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended December 31, 1927, and January 1, 1927 [1]

	1927	1926	Estimated expectancy
Cases reported			
Diphtheria:			
42 States	2,283	1,907	
97 cities	1,096	1,017	1,150
Measles:			
41 States	6,419	6,009	
97 cities	1,846	1,345	
Poliomyelitis:			
42 States	56	17	
Scarlet fever:			
42 States	3,750	4,387	
97 cities	1,229	1,542	1,195
Smallpox:			
42 States	711	675	
97 cities	90	78	68
Typhoid fever:			
42 States	242	312	
97 cities	41	67	47
Deaths reported			
Influenza and pneumonia:			
93 cities	1,013	1,014	
Smallpox:			
93 cities	0	0	

[1] The week ended Jan. 1, 1927, is considered to be the last week of 1926.

City reports for week ended December 31, 1927

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used to as many years as possible, but no year earlier than 1918 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	75,333	6	2	1	0	0	0	0	4
New Hampshire:									
Concord	22,546	0	0	0	0	0	1	0	0
Manchester	83,097	0	3	0	0	0	0	0	1
Nashua	29,723	0	0	0	0	0	0	0	0
Vermont:									
Barre	10,008	1	0	0	0	0	0	0	0
Burlington	24,089	1	0	0	0	0	0	0	0
Massachusetts:									
Boston	779,620	68	59	26	2	0	266	2	22
Fall River	128,993	1	5	3	1	1	0	0	3
Springfield	142,065	8	4	8	0	0	1	8	3
Worcester	190,757	5	5	5	0	0	0	21	2
Rhode Island:									
Pawtucket	69,760	0	1	2	0	0	0	3	2
Providence	267,918	2	10	6	0	1	2	4	6

City reports for week ended December 31, 1927—Continued

Division, State, and city	Population, July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
NEW ENGLAND—contd.									
Connecticut:									
Bridgeport	(1)	2	9	10	0	0	1	0	10
Hartford	160,197	7	8	8	0	0	0	0	7
New Haven	178,927	5	4	2	1	0	34	6	4
MIDDLE ATLANTIC									
New York:									
Buffalo	538,016	27	22	21		0	200	0	13
New York	5,873,356	105	202	275	14	14	101	20	194
Rochester	316,786	2	12	12		0	3	7	7
Syracuse	182,003	14	6	0		0	44	6	9
New Jersey:									
Camden	128,642	3	5	7	0	0	0	0	5
Newark	452,513	27	17	17	7	0	49	10	11
Trenton	132,020	1	6	3	1	2	10	0	5
Pennsylvania:									
Philadelphia	1,979,364		84	47		8			50
Pittsburgh	631,563	33	24	61		5	262	74	24
Reading	112,707	16	4	5		0	2	2	3
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	409,333	16	14	8	0	3	55	0	17
Cleveland	936,485	23	40	62	1	5	11	84	19
Columbus	279,836	11	6	10	1	1	1	3	8
Toledo	287,380	35	13	3	2	2	44	11	3
Indiana:									
Fort Wayne	97,846	2	5	3	0	0	0	0	1
Indianapolis	358,819	11	13	4	0	0	6	36	18
South Bend	80,091	2	1	2	0	0	0	0	1
Terre Haute	71,071	1	2	0	0	0	0	0	6
Illinois:									
Chicago	2,995,239	91	113	139	23	4	9	23	91
Springfield	63,923	0	2	0	0	0	0	9	2
Michigan:									
Detroit	1,245,824	34	74	45	4	2	133	16	24
Flint	130,316	10	9	6	0	0	1	11	5
Grand Rapids	153,698	1	4	1	0	0	21	0	1
Wisconsin:									
Kenosha	50,891	10	2	6	0	0	0	1	1
Milwaukee	509,192	44	24	11	0	0	2	7	7
Racine	67,707	2	3	3	0	0	0	2	0
Superior	39,671	5	0	0	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	110,502	0	2	0	0	0	1	0	2
Minneapolis	425,435	64	20	16	0	3	0	7	18
St. Paul	246,001	2	16	4	0	0	0	0	8
Iowa:									
Davenport	52,469	1	1	2	0		0	0	
Des Moines	141,441	0	5	0	0		0	0	
Sioux City	76,411		2						
Waterloo	36,771	4	0	0	0		0	0	
Missouri:									
Kansas City	367,481	16	12	2	0	1	0	31	14
St. Joseph	78,342	5	3	0	0	0	0	1	1
St. Louis	821,543	21	51	31	0	0	18	8	
North Dakota:									
Fargo	26,403	3	0	0	0	0	0	0	2
Grand Forks	14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	15,036	4	0	0	0		0	0	
Sioux Falls	30,127	0	1	0	0		0	0	
Nebraska:									
Lincoln	60,941	9	1	4	0	0	1	8	0
Omaha	211,768	6	5	3	0	0	0	0	4
Kansas:									
Topeka	55,411	20	2	6	0	0	0	2	0
Wichita	88,367	3	6	1	0	0	0	0	3

[1] No estimate made.

City reports for week ended December 31, 1927—Continued

Division, State, and city	Population, July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC									
Delaware:									
Wilmington	122,049	0	2	1	0	0	1	1	3
Maryland:									
Baltimore	796,296	67	36	35	15	0	87	4	35
Cumberland	33,741	1	1	1	0	0	1	0	2
Frederick	12,035	0	1	0	0	0	0	0	0
District of Columbia:									
Washington	497,906	4	20	13	4	4	4	0	18
Virginia:									
Lynchburg	30,395	0	2	0	0	0	0	0	2
Norfolk	(1)	10	3	2	0	0	1	0	8
Richmond	186,403	2	8	4	0	2	24	0	5
Roanoke	58,208	2	2	1	0	0	1	0	0
West Virginia:									
Charleston	49,019	1	1	0	0	0	0	0	0
Wheeling	56,208	8	2	1	0	0	0	0	6
North Carolina:									
Raleigh	30,371	4	1	2	0	0	3	0	0
Wilmington	37,061	0	0	1	0	0	117	0	1
Winston-Salem	69,031	0	1	4	0	0	10	13	1
South Carolina:									
Charleston	73,125	0	2	0	87	1	1	0	2
Columbia	41,225	6	0	0	0		100	20	
Greenville	27,311		0						
Georgia:									
Atlanta	(1)	2	4	3	37	5	2	2	8
Brunswick	16,809	0	0	0	0	0	0	1	0
Savannah	93,134	0	2	0	4	0	47	0	8
Florida:									
Miami	69,754	1		1	0	0	0	0	3
St. Petersburg	26,847		1			0			3
Tampa	94,743	7	1	2	0	0	0	0	3
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,309	0	1	0	0	1	0	0	1
Lexington	46,895	0		1	0	1	0	0	2
Louisville	305,935		8						
Tennessee:									
Memphis	174,533	5	6	7	0	0	67	5	6
Nashville	136,220	2	2	0	0	5	2	3	12
Alabama:									
Birmingham	205,670	0	3	6	0	4	5	0	9
Mobile	65,955	1	1	0	1	1	0	0	2
Montgomery	46,481	0	1	7	3	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	31,643		1						
Little Rock	74,216	0	1	1	4	0	9	0	6
Louisiana:									
New Orleans	414,493	0	12	19	18	12	0	0	35
Shreveport	57,857	2	1	2	0	0	10	0	5
Oklahoma:									
Oklahoma City	(1)	1	2	1	4	0	1	0	4
Texas:									
Dallas	194,450	11	12	23	4	5	3	0	5
Galveston	48,375	0	0	0	0	0	0	0	2
Houston	164,954	1	5	13	0	0	1	0	8
San Antonio	198,069	0	3	5	0	2	4	0	11
MOUNTAIN									
Montana:									
Billings	17,971	1	0	0	0	0	0	0	0
Great Falls	29,883	0	1	0	0	0	0	0	0
Helena	12,037	0	0	1	0	0	0	0	0
Missoula	12,668	0	0	0	0	0	0	0	1
Idaho:									
Boise	23,042	0	0	1	0	0	0	5	0

[1] No estimate made.

City reports for week ended December 31, 1927—Continued

Division, State, and city	Population, July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
MOUNTAIN—Continued									
Colorado:									
Denver	280,911	19	11	2		7	4	12	18
Pueblo	43,787	9	3	1	0	1	0	1	0
New Mexico:									
Albuquerque	21,000	1	1	1	0	0	10	0	2
Utah:									
Salt Lake City	130,948	17	3	2	0	0	0	0	3
Nevada:									
Reno	12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(1)	8	7	2	0		97	10	
Spokane	108,897	10	4	0	0		0	0	
Tacoma	104,455	0	3	0	0	0	0	0	2
Oregon:									
Portland	282,383	18	10	6	0	0	3	0	10
California:									
Los Angeles	(1)	31	41	32	16	6	3	15	31
Sacramento	72,260	0	2	1	0	1	0	0	1
San Francisco	557,530	31	20	19	0	2	8	7	6

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	2	0	0	0	0	0	1	0	7	15
New Hampshire:											
Concord	1	0	0	0	0	0	0	0	0	0	13
Manchester	1	1	0	0	0	1	0	0	0	0	19
Nashua	0	0	0	0	0	0	0	0	0	0	5
Vermont:											
Barre	0	0	0	0	0	3	0	0	0	1	7
Burlington	1	0	0	0	0	2	0	0	1	2	19
Massachusetts:											
Boston	57	77	0	0	0	16	1	1	0	27	223
Fall River	3	5	0	0	0	2	0	0	0	0	29
Springfield	7	17	0	0	0	0	0	0	0	6	43
Worcester	12	7	0	0	0	1	0	3	0	9	42
Rhode Island:											
Pawtucket	2	1	0	0	0	1	0	0	0	0	23
Providence	7	26	0	0	0	2	0	1	0	1	70
Connecticut:											
Bridgeport	9	10	0	0	0	2	0	0	0	0	43
Hartford	9	2	0	0	0	0	0	0	0	9	52
New Haven	9	2	0	0	0	2	0	0	0	11	31
MIDDLE ATLANTIC											
New York:											
Buffalo	25	42	1	0	0	7	1	0	0	21	134
New York	201	188	1	0	0	102	11	7	2	134	1,514
Rochester	13	9	0	0	0	1	1	0	0	2	61
Syracuse	12	15	0	0	0	2	0	0	0	29	44
New Jersey:											
Camden	5	6	0	0	0	0	1	0	0	0	33
Newark	20	17	0	0	0	4	1	0	0	57	109
Trenton	4	1	0	0	0	0	0	0	0	0	47
Pennsylvania:											
Philadelphia	77	75	0	0	0	35	4	1	0	35	498
Pittsburgh	36	46	0	0	0	12	1	0	1	39	216
Reading	1	7	0	0	0	0	0	0	0	2	35

[1] No estimate made.

City reports for week ended December 31, 1927—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	14	10	0	0	0	6	0	1	2	2	149
Cleveland	37	24	0	0	0	17	2	0	2	33	220
Columbus	10	32	0	1	0	6	0	2	0	1	90
Toledo	14	6	1	0	0	6	0	0	0	11	83
Indiana:											
Fort Wayne	4	4	0	0	0	0	0	1	0	0	15
Indianapolis	9	10	7	1	0	6	0	0	0	4	100
South Bend	4	2	0	0	0	0	0	0	0	1	12
Terre Haute	3	0	1	6	0	2	0	0	0	0	21
Illinois:											
Chicago	122	130	0	8	0	47	5	1	0	90	773
Springfield	2	2	0	0	0	1	0	0	0	1	22
Michigan:											
Detroit	90	93	2	2	0	21	2	0	0	47	283
Flint	8	16	0	0	0	2	0	1	0	5	42
Grand Rapids	11	8	0	0	0	2	0	0	0	3	35
Wisconsin:											
Kenosha	1	5	1	0	0	0	0	0	0	1	7
Milwaukee	25	39	2	0	0	8	1	2	0	17	111
Racine	6	4	0	0	0	1	0	0	0	5	9
Superior	2	6	2	0	0	0	0	0	0	0	10
WEST NORTH CENTRAL											
Minnesota:											
Duluth	8	0	1	0	0	0	0	1	0	2	29
Minneapolis	51	23	9	2	0	7	1	0	0	0	120
St. Paul	27	14	7	0	0	4	0	0	0	2	59
Iowa:											
Davenport	2	5	1	0	-------	-------	0	0	-------	1	-------
Des Moines	6	14	1	10	-------	-------	0	0	-------	0	-------
Sioux City	2	-------	0	-------	-------	-------	0	-------	-------	-------	-------
Waterloo	2	1	0	0	-------	-------	0	0	-------	3	-------
Missouri:											
Kansas City	12	4	1	3	0	0	0	2	0	3	128
St. Joseph	2	2	0	23	0	2	0	0	0	0	27
St. Louis	38	32	1	0	0	16	2	2	1	21	251
North Dakota:											
Fargo	2	0	0	0	0	0	0	0	0	1	9
Grand Forks	0	0	0	0	-------	-------	0	0	-------	0	-------
South Dakota:											
Aberdeen	0	0	0	0	-------	-------	0	0	-------	1	-------
Sioux Falls	1	5	0	0	-------	-------	0	0	-------	0	-------
Nebraska:											
Lincoln	2	2	0	0	0	0	0	0	0	0	13
Omaha	6	10	5	0	0	1	0	0	0	0	60
Kansas:											
Topeka	2	1	0	0	0	1	0	0	0	7	12
Wichita	4	8	0	12	0	1	0	0	0	6	27
SOUTH ATLANTIC											
Delaware:											
Wilmington	4	1	0	0	0	1	0	0	0	0	33
Maryland:											
Baltimore	29	13	0	0	0	19	3	1	0	16	234
Cumberland	0	0	0	0	0	0	0	0	0	0	6
Frederick	0	0	0	0	0	0	0	0	0	0	4
District of Columbia:											
Washington	22	33	0	0	0	11	2	0	0	4	142
Virginia:											
Lynchburg	0	0	0	0	0	1	0	0	0	0	15
Norfolk	2	4	0	0	0	2	1	0	1	1	-------
Richmond	6	6	0	0	0	2	0	1	0	0	52
Roanoke	1	4	1	0	0	1	0	0	0	0	12
West Virginia:											
Charleston	1	4	0	0	0	1	0	0	0	0	12
Wheeling	2	0	0	0	0	0	0	0	0	0	15

City reports for weeks ended December 31, 1927—**Continued**

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
North Carolina:											
Raleigh	0	1	0	0	0	1	0	0	0	2	13
Wilmington	0	0	0	0	0	1	0	0	0	0	14
Winston-Salem	1	3	1	0	0	2	0	0	0	0	------
South Carolina:											
Charleston	0	0	0	0	0	2	0	0	0	0	26
Columbia	0	1	0	0	------	------	0	0	------	0	10
Greenville	0	------	1	------	------	------	0	------	------	------	------
Georgia:											
Atlanta	4	3	1	0	0	3	0	1	1	1	88
Brunswick	0	1	0	0	0	0	0	0	0	0	5
Savannah	1	3	0	2	0	3	1	3	1	0	------
Florida:											
Miami	------	2	------	0	0	0	------	0	0	0	39
St. Petersburg	0	------	0	------	0	1	0	------	0	------	15
Tampa	1	5	1	0	0	4	0	1	0	0	31
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	0	0	0	0	2	0	0	0	0	19
Lexington	------	0	------	0	0	2	------	0	0	0	18
Louisville	5	------	0	------	------	------	0	------	------	------	------
Tennessee:											H
Memphis	5	4	1	0	0	8	0	0	0	0	65
Nashville	3	2	0	1	0	5	0	0	0	0	58
Alabama:											
Birmingham	4	2	1	1	0	4	0	0	0	3	90
Mobile	0	0	1	0	0	2	0	0	0	0	33
Montgomery	0	0	1	0	0	0	0	2	0	0	------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	------	0	------	------	------	0	------	------	------	------
Little Rock	2	2	0	1	0	5	0	0	0	0	------
Louisiana:											
New Orleans	5	3	0	0	0	12	2	2	0	3	216
Shreveport	2	3	1	0	0	0	0	0	0	0	20
Oklahoma:											
Oklahoma City	3	4	1	9	0	3	0	1	0	0	27
Texas:											
Dallas	3	6	0	0	0	5	0	0	0	2	71
Galveston	0	1	0	0	0	0	0	0	0	0	11
Houston	2	8	1	0	0	3	0	0	1	0	70
San Antonio	1	7	0	0	0	10	0	1	0	0	78
MOUNTAIN											
Montana:											
Billings	1	1	0	1	0	0	0	0	0	1	7
Great Falls	1	3	1	0	0	0	0	1	0	0	------
Helena	0	3	0	2	0	0	0	0	0	0	6
Missoula	1	0	0	0	0	0	0	0	0	0	8
Idaho:											
Boise	2	0	0	0	0	0	0	0	0	0	6
Colorado:											
Denver	12	6	1	1	0	11	0	1	0	4	105
Pueblo	2	9	0	6	0	0	0	0	0	1	7
New Mexico:											
Albuquerque	0	2	0	0	0	8	0	0	0	0	17
Utah:											
Salt Lake City	2	3	1	6	0	0	0	0	0	0	45
Nevada:											
Reno	0	1	0	0	0	0	0	0	0	0	1

City reports for week ended December 31, 1927—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
PACIFIC											
Washington:											
Seattle	9	3	2	1			1	0		1	
Spokane	5	11	4	5			0	0		0	
Tacoma	3	1	3	1	0	1	0	0	0	0	20
Oregon:											
Portland	7	8	6	11	0	3	0	1	0	0	80
California:											
Los Angeles	24	23	4	0	0	25	2	0	0	7	306
Sacramento	2	1	1	0	0	2	0	0	0	0	24
San Francisco	13	9	0	4	0	5	1	0	0	3	164

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	1	0	1	0	0	0	1	2
Fall River	0	0	0	0	0	0	0	1	0
Worcester	0	0	0	0	0	0	0	1	1
MIDDLE ATLANTIC									
New York:									
New York	2	3	3	12	0	0	1	1	1
Pennsylvania:									
Philadelphia	0	0	0	0	1	1	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	2	0	0	0	0	0	0	0	0
Illinois:									
Chicago	4	2	0	0	0	0	0	0	0
Michigan:									
Detroit	0	1	0	0	0	0	0	1	0
Wisconsin:									
Milwaukee	2	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	0	0	0	0	0	0	0	1	0
Minneapolis	0	1	0	1	0	0	0	0	0
Missouri:									
St. Joseph	1	0	0	0	0	0	0	0	0
Nebraska:									
Omaha	1	0	0	0	0	0	0	0	0
Kansas:									
Wichita	0	1	0	0	0	0	0	0	0
SOUTH ATLANTIC									
North Carolina:									
Wilmington	0	1	0	0	0	0	0	0	0
Georgia:									
Savannah [1]	0	0	0	0	0	1	0	0	0

[1] Typhus fever: 2 cases at Savannah, Ga.

City reports for week ended December 31, 1927—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	1	0	0	0
Louisiana									
New Orleans	0	0	0	0	3	0	0	0	0
Oklahoma:									
Oklahoma City	0	0	0	1	0	0	0	0	0
Texas:									
Dallas	0	1	0	0	2	1	0	0	0
MOUNTAIN									
Montana:									
Missoula	1	0	0	0	0	0	0	0	0
Colorado:									
Denver	2	1	0	0	0	0	0	0	0
Utah:									
Salt Lake City	2	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	1	-------	0	-------	0	-------	0	0	-------
Spokane	2	-------	0	-------	0	-------	0	0	-------
Oregon:									
Portland	1	2	0	0	0	0	0	4	3
California:									
Los Angeles	0	0	0	0	1	1	0	2	0
Sacramento	1	0	0	0	0	0	0	0	0
San Francisco	0	0	0	0	0	0	0	1	1

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended December 31, 1927, compared with those for a like period ended January 1, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1926 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 30,445,000 in 1926 and 30,966,000 in 1927. The 95 cities reporting deaths had nearly 29,785,000 estimated population in 1926 and nearly 30,296,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, November 27 to December 31, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927
101 cities	224	233	201	204	188	[2] 206	[3] 163	[2] 203	176	[4] 187
New England	172	267	163	216	160	200	160	193	158	165
Middle Atlantic	177	252	161	228	167	226	140	233	171	221
East North Central	266	220	223	228	213	248	[5] 182	212	193	200
West North Central	210	179	194	129	129	129	113	123	165	[6] 129
South Atlantic	240	225	237	190	216	140	[7] 214	143	173	[8] 128
East South Central	300	168	284	71	145	[2] 162	150	[2] 177	186	[2] 147
West South Central	318	273	266	218	258	218	168	344	223	[9] 271
Mountain	228	144	246	144	164	162	137	117	137	63
Pacific	268	259	238	168	252	168	225	157	155	141

MEASLES CASE RATES

	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927
101 cities	177	189	197	225	193	[2] 249	[3] 209	[2] 288	231	[4] 315
New England	101	539	165	539	229	604	167	536	184	708
Middle Atlantic	37	180	23	199	24	206	22	251	22	331
East North Central	151	122	212	140	256	117	[5] 249	157	294	160
West North Central	113	24	129	50	109	46	77	38	61	[6] 39
South Atlantic	48	308	54	527	89	607	[7] 62	797	179	[8] 730
East South Central	26	224	78	367	21	[2] 737	31	[2] 1,032	78	[2] 545
West South Central	142	122	146	134	82	252	103	84	13	[9] 116
Mountain	2,844	27	3,217	36	2,351	27	2,780	18	3,545	36
Pacific	699	228	613	178	603	238	879	257	697	283

SCARLET FEVER CASE RATES

	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927
101 cities	242	184	238	184	279	[2] 212	[3] 253	[2] 187	267	[4] 210
New England	325	276	340	320	387	32	248	281	356	346
Middle Atlantic	157	155	178	156	214	199	212	173	235	200
East North Central	237	192	235	216	241	243	[5] 255	212	245	257
West North Central	436	250	432	208	413	204	371	202	385	[6] 194
South Atlantic	181	174	173	134	199	163	[7] 171	145	238	[8] 150
East South Central	243	148	150	82	248	[2] 147	243	[2] 103	176	[2] 59
West South Central	210	143	142	117	236	172	125	92	150	[9] 129
Mountain	930	360	802	306	1,112	243	975	171	893	234
Pacific	265	128	230	152	383	154	303	191	252	126

SMALLPOX CASE RATES

	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927
101 cities	14	17	11	13	16	[2] 19	[3] 14	[2] 16	14	[4] 15
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	1	0	1	0	0	0	1	0
East North Central	21	10	7	4	11	17	[5] 16	12	7	12
West North Central	48	115	38	75	46	115	28	77	40	[6] 82
South Atlantic	19	5	19	7	26	5	[7] 30	20	41	[8] 4
East South Central	0	10	21	5	78	[2] 7	36	[2] 29	47	[2] 15
West South Central	9	8	9	8	43	0	26	13	21	[9] 4
Mountain	18	45	18	99	0	117	18	99	9	144
Pacific	35	39	43	39	40	31	43	26	21	29

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1926 and 1927, respectively.
[2] Louisville, Ky., not included.
[3] Terre Haute, Ind., and Norfolk, Va., not included.
[4] Sioux City, Iowa, Greenville, S. C., Louisville, Ky., and Fort Smith, Ark., not included.
[5] Terre Haute, Ind., not included.
[6] Sioux City, Iowa, not included.
[7] Norfolk, Va., not included.
[8] Greenville, S. C., not included.
[9] Fort Smith, Ark., not included.

Summary of weekly reports from cities, November 27 to December 31, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926 —Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927
101 cities	10	9	13	11	12	[2] 8	[3] 10	[2] 11	12	[4] 7
New England	7	7	2	12	31	0	40	9	24	14
Middle Atlantic	9	10	18	8	8	8	5	10	7	4
East North Central	6	5	3	9	5	8	[5] 3	8	5	5
West North Central	10	12	4	14	10	6	10	8	4	[6] 10
South Atlantic	17	16	24	9	19	9	[7] 16	16	84	[8] 13
East South Central	41	15	41	31	21	[2] 29	16	[2] 29	21	[2] 15
West South Central	9	21	13	21	21	17	17	17	17	[9] 13
Mountain	9	9	9	9	9	18	0	9	27	18
Pacific	16	5	16	13	24	16	21	10	16	0

INFLUENZA DEATH RATES

	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927
95 cities	14	12	17	12	14	[2] 14	[3] 15	[2] 17	17	[10] 19
New England	7	5	9	9	7	12	7	5	12	5
Middle Atlantic	13	11	12	7	13	9	14	11	21	14
East North Central	9	9	14	9	12	11	[5] 10	18	15	10
West North Central	4	4	15	6	15	6	11	10	8	8
South Atlantic	21	13	34	17	26	15	[7] 34	20	17	[8] 22
East South Central	41	46	41	76	5	[2] 88	36	[2] 59	26	[2] 81
West South Central	40	43	40	4	40	56	18	73	13	82
Mountain	46	27	36	9	9	9	27	27	46	72
Pacific	11	14	11	3	7	17	4	24	0	31

PNEUMONIA DEATH RATES

	Dec. 4, 1926	Dec. 3, 1927	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927
95 cities	123	114	120	110	137	[2] 118	[3] 137	[2] 135	164	[10] 157
New England	118	100	134	51	140	102	151	121	172	146
Middle Atlantic	151	123	140	119	147	117	166	127	180	158
East North Central	89	103	103	97	117	97	[5] 109	105	134	135
West North Central	74	71	118	100	120	91	91	98	118	108
South Atlantic	106	149	155	138	127	164	[7] 153	186	187	[8] 189
East South Central	134	199	171	148	129	[2] 162	109	[2] 243	191	[2] 221
West South Central	163	108	150	103	172	194	84	233	150	310
Mountain	210	54	109	216	273	135	164	243	201	198
Pacific	152	103	113	110	124	131	148	165	198	138

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1926, and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1926	1927	1926	1927
Total	101	95	30,443,800	30,966,700	29,783,700	30,295,900
New England	12	12	2,211,000	2,245,900	2,211,000	2,245,900
Middle Atlantic	10	10	10,457,000	10,567,000	10,457,000	10,567,000
East North Central	16	16	7,650,200	7,810,600	7,650,200	7,810,600
West North Central	12	10	2,585,500	2,626,600	2,470,600	2,510,000
South Atlantic	21	20	2,799,500	2,878,100	2,757,700	2,835,700
East South Central	7	7	1,008,300	1,023,500	1,008,300	1,023,500
West South Central	8	7	1,213,800	1,243,300	1,181,500	1,210,400
Mountain	9	9	572,100	580,000	572,100	580,000
Pacific	6	4	1,946,400	1,991,700	1,475,300	1,512,800

[2] Louisville, Ky., not included.
[3] Terre Haute, Ind., and Norfolk, Va., not included.
[4] Sioux City, Iowa, Greenville, S. C., Louisville, Ky., and Fort Smith, Ark., not included.
[5] Terre Haute, Ind., not included.
[6] Sioux City, Iowa, not included.
[7] Norfolk, Va., not included.
[8] Greenville, S. C., not included.
[9] Fort Smith, Ark., not included.
[10] Greenville, S. C., and Louisville, Ky., not included.

FOREIGN AND INSULAR

PLAGUE ON VESSEL

Vessel at La Plata from Rosario, Argentina.—Information dated January 4, 1928, shows the arrival of a case of plague at La Plata on a vessel coming from Rosario, Argentina.

THE FAR EAST

Report for the week ended December 24, 1927.—The following report for the week ended December 24, 1927, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Alexandria.
Dutch East Indies.—Balik-Papan, Makassar.
India.—Bassein, Rangoon.

CHOLERA

India.—Calcutta, Rangoon.
Straits Settlements.—Singapore.
Siam.—Bangkok.

SMALLPOX

India.—Bombay, Calcutta, Rangoon, Moulmein.
Kwangtung.—Dairen.
Manchuria.—Mukden.

Returns for the week ended December 24 were not received from the following ports:

Aden Protectorate.—Aden, Kamaran, Perim.
Iraq.—Basra.
India.—Madras, Tuticorin.
Ceylon.—Colombo.
Dutch East Indies.—Pontianak.
China.—Canton.
Union of Socialist Soviet Republics.—Vladivostok.

ANGOLA

Communicable diseases—October, 1927.—During the month of October, 1927, communicable diseases were reported in Angola as follows:

October, 1927—Cases

Disease	Coast district	Interior	Land frontier	Total
Ancylostomiasis	13	7		20
Beriberi	2	8		10
Bilharzia	6	2		8
Chicken pox	25	11	3	39
Dysentery	39	11	13	63
Hemogobin fever	2	9		11
Influenza	54	81	56	191
Leprosy		1		1
Malaria	266	72	90	428
Measles	26			26
Meningitis			1	1
Mumps	4		6	10
Pneumonia	32	6	3	41
Relapsing fever	1	1	2	4
Scabies	6			6
Smallpox	6	77		83
Tuberculosis	19		5	24
Trypanosomiasis	128	14	99	241
Venereal diseases	122	26	67	215
Whooping cough	37		2	39
Yaws	168	76	48	292

ARGENTINA

Campaign of disinfection and rat destruction—Rosario.—Under date of December 24, 1927, a campaign of intensive disinfection and destruction of rats was reported as being carried out at Rosario, Argentina.

BARBADOS (BRITISH WEST INDIES)

Malarial fever—October, 1927.—Information dated November 15, 1927, shows the occurrence of an outbreak of malarial fever in the Island of Barbados, British West Indies, during October, 1927, with 200 cases distributed in two districts of the island. The infection was attributed to importation of mosquitoes on a vessel arrived from a port in Cuba. Later information shows rapid spread of the epidemic and a total of about 400 cases by the last of October. The outbreak was stated to be among plantation laborers.

CANADA

Communicable diseases—Week ended December 24, 1927.—The Canadian Department of Health reports cases of certain communicable diseases from six Provinces of Canada for the week ended December 24, 1927, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Manitoba	Saskatchewan	Alberta	Total
Influenza	3						3
Poliomyelitis			1			1	2
Smallpox				2	12		14
Typhoid fever		48	10	1		1	60

Report from Ontario for week ended Dec. 17, cerebrospinal fever, 1; lethargic encephalitis, 1; smallpox, 104; typhoid fever, 11.

Communicable diseases—Week ended December 31, 1927.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended December 31, 1927, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever				1				1
Influenza	9				3			12
Lethargic encephalitis				1				1
Poliomyelitis				1			1	2
Smallpox				53		13	3	69
Typhoid fever	26	78	7	5	1	1	1	119

Communicable diseases—Quebec—Week ended December 24, 1927.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended December 24, 1927, as follows:

Disease	Cases	Disease	Cases
Chicken pox	47	Scarlet fever	88
Diphtheria	78	Smallpox	14
Influenza	3	Tuberculosis	43
Measles	80	Typhoid fever	10
Poliomyelitis	1	Whooping cough	21

Communicable diseases—Quebec—Week ended December 31, 1927.—The bureau of health of the Province of Quebec reports cases of certain communicable diseases for the week ended December 31, 1927, as follows:

Disease	Cases	Disease	Cases
Chicken pox	61	Smallpox	3
Diphtheria	68	Tuberculosis	23
Influenza	33	Typhoid fever	7
Measles	86	Whooping cough	9
Scarlet fever	74		

Communicable diseases—Ontario—November, 1927—Comparison with corresponding period, year 1926.—During the month of November, 1927, communicable diseases were reported in the Province of Ontario, Canada, as follows:

Disease	November, 1927		November, 1926	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis	1			2
Chancroid	7		1	
Chicken pox	1,080		1,527	
Diphtheria	343	17	393	14
Dysentery		4		
German measles	14		15	
Gonorrhea	170		157	
Influenza		3		7
Lethargic encephalitis	4	1	2	
Measles	542		746	
Mumps	1,007		47	
Pneumonia		74		127
Poliomyelitis	7		8	1
Scarlet fever	402	4	546	
Smallpox	271		95	1
Syphilis	115		99	
Tuberculosis	94	53	84	42
Typhoid fever	59	1	46	5
Whooping cough	285		312	2

Smallpox.—Smallpox was reported present in 21 localities, the greatest prevalence being reported at Ottawa, with 97 cases, Toronto 59, and East York, 51. At eight localities one case each was reported.

CUBA

Communicable diseases—Habana, Cuba—December, 1927.—During the month of December, 1927, communicable diseases were reported in Habana, Cuba, as follows:

Disease	New cases	Deaths	Remaining under treatment Dec. 31, 1927	Disease	New cases	Deaths	Remaining under treatment Dec. 31, 1927
Chicken pox	3	1	1	Measles	9		4
Diphtheria	8	1	4	Paratyphoid fever	1	1	
Leprosy			18	Scarlet fever	4		
Malaria [1]	77		13	Typhoid fever [1]	47	5	44

[1] Many of these cases from the interior.

ECUADOR

Plague—Plague-infected rats—Guayaquil—November, 1927.—During the month of November, 1927, nine cases of plague, with three deaths, were reported at Guayaquil, Ecuador.

During the same period, of 23,240 rats taken at Guayaquil, 6 rats were found plague infected.

Smallpox.—During the period under report one case of smallpox was reported at Guayaquil.

GREAT BRITAIN

Smallpox—Newcastle-on-Tyne District.—Information dated January 7, 1928, shows marked prevalence of smallpox in the Newcastle-on-Tyne area, Great Britain, with many new cases reported daily. The type of the disease is stated to be mild.

HAWAII TERRITORY

Rodent report—Hilo laboratory—November, 1927.—The rodent report from the Hilo laboratory at Hilo, Hawaii, for the month of November, 1927, shows that 13,009 rodents were received and examined during the month. Of these, four were found plague infected. There were no cases of human plague reported, the last case being on August 12, 1927. The last case of rodent plague occurred on November 25, 1927, at Honokaa, Hawaii.

IRAQ

Cholera—November 27–December 3, 1927—Summary.—During the week ended December 3, 1927, 56 cases of cholera with 53 deaths were reported in Iraq. The occurrence was distributed as follows:

Province	Nov. 27-Dec 3, 1927		Summary to Dec 3, 1927	
	Cases	Deaths	Cases	Deaths
Amarah	1	1	184	146
Baghdad	38	38	70	48
Basra			417	337
Diwaniyah			91	50
Diyala	1	1	1	1
Dulaim	1		1	
Hillah	7	4	94	54
Kerbala			43	31
Kut			34	22
Muntafique	8	8	215	139
Ramadi		1	85	64
Total	56	53	1,235	892

JAVA

Plague—Surabaya—November 10, 1927.—Under date of November 11, 1927, Surabaya, Island of Java, was reported plague infected.

MALTA

Communicable diseases—November, 1927.—During the month of November, 1927, communicable diseases were reported in the island of Malta as follows:

Disease	Cases	Disease	Cases
Broncho-pneumonia	5	Poliomyelitis	1
Diphtheria	5	Scarlet fever	12
Erysipelas	3	Trachoma	48
Malta (undulant) fever	66	Tuberculosis	21
Measles	1	Typhoid fever	74
Pneumonia	4	Whooping cough	3

Population, civil, estimated, 227,440.

MAURITIUS

Plague—Port Louis—September, 1927.—During the month of September, 1927, a case of plague was reported at Port Louis, island of Mauritius.

MEXICO

Mortality, November and December, 1927—Malaria and typhoid fever prevalence—Progreso.—During the month of November, 1927, 64 deaths were reported at Progreso, Mexico, and during December, 1927, 73 deaths. The principal causes of death were stated to be malarial fevers. Severe typhoid fever prevalence was reported, and it was stated that an active campaign of inoculation against the disease was being carried out. Population, 8,877.

UNION OF SOUTH AFRICA

Plague—Orange Free State—Infection among wild rodents—November 13–19, 1927.—During the week ended November 19, 1927, a fatal case of plague was reported in the Orange Free State, Union of South Africa. The case occurred in a native laborer employed on Lang Tlass farm, Heilbron District, situated 8 miles east of Dover Station, who, feeling sick, was proceeding to Johannesburg. He was admitted to hospital and died the following day. It was stated that active plague infection had been verified among veldt rodents on the Lang Tlass farm.

Smallpox.—During the week ended November 19, 1927, outbreaks of smallpox were reported in Bothaville District, Orange Free State.

Typhus fever.—During the four weeks ended November 26, 1927, typhus fever was reported present in the Cape Province, Natal, and Transvaal.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Week ended—															
		September, 1927				October, 1927					November, 1927				December, 1927		
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17
China:																	
Amoy	C	18	21	19	14	10	4	2									
	D	1	2														
Canton	C	10	17	7	2	6		2	6	5	1	6			1		
	D	6	10	7	2	6		2	6	5	1	5			1		
Foochow	C	P		P	P	P	P	P	P								
Hong Kong	C	1	P	P	P	P	P	P									
	D	1															
Shanghai	C	1	3	2		1	2										
	D	25	22	21	6	4		2	1								
Swatow	C	P	P		P		P	P	P	P	P						
Tientsin	C	4	3	5	3	2											
India	C	11,180	8,391	6,630	5,189	4,907	4,055	6,142	5,056	5,303	4,845	5,987					
	D	5,559	4,278	3,532	2,526	2,549	2,104	3,027	2,691	2,867	2,641	3,350					
Bombay	C	1	1	1								2					
	D	1	1									2					
Calcutta	C	18	19	20	19	21	13	34	33	28	35	65	71	156			
	D	10	13	5	11	15	11	19	19	22	25	42	49	106	77	55	43
Madras	C	29	8	15	7	4	9		1			6	7				
	D	24	11	6	7	3	3	1	1			3	4	1		1	
Rangoon	C				2	3	1		2		1		1	3			
	D				2	3	1		1	1		3	4	2	1	2	1
India, French Settlements in	C	6	4	1													
	D	3	4	1													
Karikal	C	1															
	D	1															
Pondicherry	C	4	4	1	6												
	D	2	4	1	8												
Indo-China: Saigon	C						1			1							

Iraq:[1]																	
Amarah	C								35	4	8	3	2			1	
	D								23	6	8	3	2			1	
Baghdad	C								1		10	13	8				
	D								1		5	2	2				
Basra	C								1								
Diwaniyah	C								28	4	3	1	2				
	D								17	2			1				
Hillah	C								12	7	3	5	53				
	D								7	6	2	1	29				
Kerbala	C								3	1	4	2	2				
	D								3	1	5	2	2				
Kut	C								11	9	1	5					
	D								8	4	1	3					
Muntafique	C								4			4	14				
	D								1			2	10				
Ramadi	C									19	18	27	21				
	D									10	23	14	16				
Java: Batavia	C										1	2	25	2			
	D										1	2	15	2			
Siam	C	4	5	21		6	4	8	8	14	23	43	30	19			
	D	3	3	11		4	2	5	7	10	15	25	26	11			
Bangkok	C	1	1	1			2	3	1		1		3		1	1	1
	D			1				3	1		1		1		1		1
Straits Settlements: Singapore	C									1				1	2		2
	D									1				2			2
On vessel S. S: Tabaristan; at Basra	C						1										

[1] From July 24 to Oct. 8, 1927, 831 cases and 617 deaths from cholera were reported in Iraq, of these 131 cases and 103 deaths occurred in Amarah; 416 cases and 337 deaths in Basra; 53 cases and 30 deaths in Diwaniyah; 7 cases and 5 deaths in Hillah; 31 cases and 18 deaths in Kerbala; 8 cases and 6 deaths in Kut; and 185 cases and 118 deaths in Muntafique.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Week ended—																	
		September, 1927				October, 1927					November, 1927				December, 1927				
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31
Algeria: Oran	C		1								1		1						
	D		1																
Argentina:																			
Bahia Blanca District	C													1	1	1			
Cordoba Province	C					P	P	P	P	P	P			10					1
Firmat	C																1		
Quilino	C													1	1	1			
Rosario	C													1	1	1	1		3
Unacha	C																1		
Azores: St. Michaels Island	C		1		1	1			2	1		1	1	1	1	1			
	D		1			1										1			
British East Africa: Tanganyiki	D				10	10					10								
Canary Islands: Las Palmas	C						4	4	1					1			1		
Ceylon: Colombo	C	1		1	1	2			1					1					
	D	1		1	1	1													
China: Tungliao	D							200											
Egypt:																			
Alexandria	C	1												5	2				
	D													5	2				
Suez	C		1																
Greece:																			
Mitylene	C				5														
Patras	C	2				1					1								
	D					1					1								
India	C	403	1,087	612	608	655	715	920	956	812	1,015	856							
	D	216	569	324	319	381	359	508	544	495	551	485							
Bombay	C	3	1	1	2		2		2										
	D	2	1	1	1		2		1										
Calcutta	C	18																	
	D	10																	
Madras	C	144	111	87	123	88	156	167	172		83	152							
	D	76	62	43	49	60	72	72	84		54	80							
Rangoon	C	2		4		3	4	1	3	5	2		4	5					
	D	2		4		3	4	1	3	5	2		4	5					

Indo-China: Saigon	C		1	1									1						
Java:																			
Batavia	C	18	14	17	21	24	33	42	31	41	29	31	34						
	D	18	14	17	21	24	33	41	31	41	29	31	34						
East Java and Madura	C	5	4	2	7	3	3	7	4	3	4	2							
	D	5	4	2	7	3	3	7	4	3	4	2							
Senegal	C				129														
	D				75														
Baol	C	32		27	13	39		56					P		P				
	D	11		15	7	26		14											
Cayor	C	81	103	175	104	101	45	20	10	32	8	8	P						
	D	27	58	90	58	57	16	10	5	20	4	4							
Dakar	C	9	5	5	1	1													
	D	4	4	3	1														
Louga	C				5		8												
	D				4														
Rufisque	C	4	9	2	1														
	D	3	7	1	1														
Thies	C	2		2	5					1									
	D	2		1	4														
Siam	C						1	11	1					2					
	D						1	8			1			1					
Bangkok	C						1		1										
	D										1								
Turkey: Constantinople	C				1	1								1					
Union of South Africa:	D					1													
Cape Province—Richmond District	C									2									
	D									2									
Orange Free State	C												1						
	D												1						
On vessel: At La Plata, from Rosario, Argentina	C																		1

Place		July	August	September	October	November
Algeria: Algiers	C				2	
Ecuador: Guayaquil	C	5	7	3	4	9
	D					3
Madagascar:						
Ambositra Province	C	6	1			
	D	6	1			
Antisirabe Province	C		34	5		
	D		34	4		
Itasy Province	C	14	11	21		
	D	14	7	20		
Madagascar—Continued:						
Moramanga Province	C	5	4	3		
	D	5	4	3		
Tananarive Province	C	21	48	142		
	D	19	43	127		
Peru	C	8	11			
	D	7	6			
Callao	D	3				

Indo-China (French), 13 cases, Sept. 1-20; Beirut, Syria, 1 case, Sept. 1-10; 1 case, Oct. 21-31; 1 case, Dec. 1-10.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Week ended— Sept., 1927, 3	Sept. 10	Sept. 17	Sept. 24	Oct., 1927, 1	Oct. 8	Oct. 15	Oct. 22	Oct. 29	Nov., 1927, 5	Nov. 12	Nov. 19	Nov. 26	Dec., 1927, 3	Dec. 10	Dec. 17	Dec. 24	Dec. 31	Jan. 7, 1928
Algeria: Oran	C										10	4	6	9	11	10				
Arabia: Aden	C												1		1					
Brazil: Rio de Janeiro	C			3						1										
	D			6						1										
British East Africa: Tanganyika	D			8				7												
British South Africa:																				
Northern Rhodesia	C		18					44			10	22	3	57						
	D							1			23		1	18						
Southern Rhodesia	C												3							
Canada:																				
Alberta	C	3	1	5	8	5	4	5	9	6	2	1	1	7	3	3	6		3	
Edmonston	C									1				6		1	1			
British Columbia—																				
Vancouver	C	2														4				
Manitoba	C	2		7			2		5	3	14		2	1	3	1	2	2		
Winnipeg	C			4			1		1				2			1	1	1		
New Brunswick	C			2														1		
Nova Scotia	C			1				1												
Halifax	C							1												
Ontario	C			12	10	6	26	26	38	64	38	77	85	71	90	82	104		53	
Hamilton	C														2					
Kingston	C												1					1		
Ottawa	C	9	13	12	6	3	15	28	26	47	17	51	19	10	19		84	18		20
Toronto	C		1		1		3	1	6	2	16	3	13		25	14		7		
Windsor	C							9												
Quebec	C								8	7	3	12	3	8	5	3		14	8	
Montreal	C											1						1		
Quebec	C														2		2			
Reviere du Loup	C												3							
Saskatchewan	C	13	33		22	12		8	11	5	12	2	14	9	15	19	15	12	13	
Moose Jaw	C		9		7				3								1		1	
Regina	C						5					1					1			
Saskatoon	C															2				

China:																				
Canton	C				1															
	D				1															
Chefoo	C				1			P		P				P						
	D				1															
Foochow	C		P					P	P		P									
Hong Kong	C	2																		
	D	1		1																
Manchuria—																				
Changchun	C													1						
Dairen	C								1		2									
	D								1											
Fushun	C			1								1								
Mukden	C					1			1	1										
Pensihu	C					1														
Tientsin	C					12			1	8				4	1					
Egypt	C	3																		
	D	1				1														
Great Britain:																				
England and Wales	C	111	146	126	125	122	149	124	200	199	219	258	226	233	366	230	212			
Bradford	C									1	5	3	2	9	6	2	2			
Bristol	C								6	1			3	2	4	2				
Cardiff	C									1										
Leeds	C	3				3	1		6	1	1	1	2	3	3	6	4	4		
Manchester	C						1	2			1	1	4	2	5	10	8			
Newcastle upon Tyne	C			2		1		5		2	6		1	28	18	5	4	2	13	
Sheffield	C				1		3	3	4	4			2	1	8					
India	C	1,456	1,109	1,111	722	923	503	777	860	779	805	1,235								
	D	397	266	284	173	179	159	171	206	190	200	211								
Bombay	C	7	3	1	1	4	2		4	2		2			4					
	D	5	2	1					2	2		1			1					
Calcutta	C	4	6	10	2		4	1					5	4						
	D	2	5	5	2		3	1	1				2	2						
Madras	C	2		3	2	3	1	2	2	3		2	2	2	2	5				
	D			1	1					1		1		1	1	1				
Rangoon	C	2		1	6	2	8		7	4		1	1	5						
	D	1			1	1	1		1	1				1						
India, French settlements in:																				
Karikal	C				1															
	D				1															
Pondicherry	C	11	8	2	16															
	D	11	8	2	16															
Indo-China: Saigon	C		1																	
Iraq:																				
Baghdad	C		1			5			2			5			5					
	D		1			3			1			4			5					
Basra	C			4				2												
	D			4				2												
Italy: Rome and vicinity	C		1																	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Week ended— September, 1927: 3	Sept. 10	Sept. 17	Sept. 24	October, 1927: 1	Oct. 8	Oct. 15	Oct. 22	Oct. 29	November, 1927: 5	Nov. 12	Nov. 19	Nov. 26	December, 1927: 3	Dec. 10	Dec. 17	Dec. 24	Dec. 31	Jan. 7, 1928
Jamaica (outside Kingston) (alastrim)	C	2	2	2	3	1	4	4		7				1						
Kingston (alastrim)	C	2		1			2													
Java:																				
Batavia	C					3		1				25								
	D											15								
East Java and Madura	C		14	3	5	1		7		1	3	5								
	D							1												
Mexico:																				
Acapulco	C	1		1								1								
	D	1		1								1								
Guadalajara	D													1			1			
Mexico City and surrounding territory	C													1	1	1				
Torreon	D						2													
Palestine: Jerusalem	C														1					
Portugal:																				
Lisbon	C	1		1	1	1	4	1	2	1	2									
Oporto	C		1																	
Siam	C	24	3				3	3					1							
	D	14	1																	
Bangkok	C												1							
Spain:																				
Malaga	D												1							
Valencia	C					1														
Union of South Africa: Cape Province	C						P													
Venezuela: Maracaibo	D			2			1													

Place	September, 1927			October, 1927			November, 1927	
	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Algeria C	110	162	110	182	386			
Oran C	4		12	6		5		

Place	September, 1927			October, 1927			November, 1927	
	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Indo-China C	6	6	9		4			
Syria: Damascus C		1	4	14	8			13

Place	July	August	September	October	November
Angola C	42	2	5	73	
D				2	
Congo C			5	77	
Cuanza-Norte C			1		
Leonda C			1		
Zaire C			3		
Brazil: Porto Alegre C	5	3	3	4	
British East Africa: Zanzibar C				2	
D				1	
Chosen C	19	2			
D	6				

Place	July	August	September	October	November
Ecuador, Guayaquil C		2	2	1	1
France C	23	6	8		
Gold Coast C	1	1			
Latvia C				2	
Mexico D	93				
Morocco C		76	51		
Nigeria C	492	91			
D	83	20			
Spain: Madrid D					1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Week ended—																
		September, 1927				October, 1927					November, 1927				December, 1927			
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24
Bulgaria: Sofia	C					8	4	3	2	3	1	2						
	D										1							
Chile:																		
Antofagasta	D					1												
Valparaiso	C	1												1	1			
	D	1											1					
China:																		
Manchuria: Harbin															1			
Tientsin	C				2													
Egypt	C					3	3	5	1		4			1				
	D					2	1	1	1									
Port Said	C					1									1			
Ireland:																		
Cork County	C															3		
Donegal County—Letterkenny	C								4									
Mexico: Mexico City (including municipalities in Federal District)	C	9	4	1	5	7		3	8	9	6	2	11	7	6	4		4
	D										2						1	1
Palestine	C	3		5			3						2	3	1			
Haifa	C						2						1	1				
Herzliah	C													1				
Jaffa	C					1								1				
Nazareth	C												1					
Safad	C													1				
Tel-Aviv	C						1							1	1			
Poland	C	12	5	12	6	10	9			35	12	6						
	D			2		3	1			6	3							
Portugal: Oporto	C									1								1
Rumania	C	2	2	9	3	5												
	D					1												
Syria: Aleppo	C			2														
Tunisia	C			1				2	1									

Union of South Africa:																		
Cape Province	C	P					P	P	P	P				P				
Natal	C									P				P				
Orange Free State	C						P											
Transvaal—																		
Johannesburg	C								5									

Place		September, 1927			October, 1927	
		1-10	11-20	21-30	1-10	11-20
Algeria	C	5	3	2	7	4
	D					1
Algiers	C	1	5		1	1
Bulgaria	C	5	1	1		
	D		1	1		
Morocco	C	3	2	2	6	4

Place		July	August	September	October	November
Chosen	C	72	17			
	D	8				
Chemulpo	C	1	2			
Gensan	C	2				
Seoul	C	2	3		2	
	D	1			1	
Czechoslovakia	C	6				
Greece: Athens	C	1				
Japan	C	1				
Latvia	C	6				
Lithuania	C	44	18	7		
	D	5	8	1		
Mexico	D	12				
Peru:						
Arequipa	D		2	1	2	
Lima	D	8				
Yugoslavia	C	11	9		1	1
	D	4	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C, indicates cases; D, deaths; P, present]

Place		Week ended—																
		September, 1927				October, 1927				November, 1927				December, 1927				
		3	10	17	24	1	15	22	29	5	12	19	26	3	10	17	24	31
Belgian Kongo: Boma and Matadi	C																	7
Dahomey: Grand Popo	C												1					
	D												1					
Liberia: Monrovia	C		1															
Nigeria	C			2														
	D			2														
Senegal	C					5		5	9	16	6	7						
	D					5		4	8	10	4	6						
Dakar	C			P					3	6		5	2	1	4			
	D								2	4		4	2	1	4			
Geoul	C					1												
	D					1												
Goree, Island of	C	2																
	D	2																
Kebemer	C						1	1										
	D						1	1										
Kelle	C						2		1									
	D						1		1									
Keur Samba Kane	C								1	1								
	D									1								
Keur Madiop	C								1									
	D								1									
Khombole	C					1						1						
	D					1						1						
Louga	C					1			2	1	1							
	D					1			2	1	1							
Mekhe	C							1	1	2	2							
	D								1	1	1							
M'Dande	C							1		2	1							
	D							1		1								
Pout	C				1													
	D				1													

[illegible]	C						1											
	D						1											
St. Louis	C					1												
	D					1												
Sebikotane	C							1		2	1							
	D							1			1							
Thies	C			1	2	1		1	1	2	1	1						
	D			1	2	1		1	1	2	1	1						
Tiaroye	C	1																
	D	1																
Tivaouane	C		1															
On vessel, S. S. Desirado, at Leixoes, Portugal	C			1														
	D			1														

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 43 :: :: NUMBER 4

JANUARY 27 - - 1928

SPECIAL ARTICLES

Prevalence of Smallpox in the United States

Running Water is Not Always Pure—Oxygen Demand of Polluted Waters

Experimental Black Tongue of Dogs and Pellagra

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 43 JANUARY 27, 1928 NO. 4

PREVALENCE OF SMALLPOX IN THE UNITED STATES

The health officers of 37 States reported 28,000 cases of smallpox during 52 weeks ended December 31, 1927. This number is practically the same as the number reported by the same States for 52 weeks in 1925, but it is 2,300 cases more than were reported for the same period in 1926.

The figures are shown in the following table, preliminary weekly telegraphic reports being used for each year:

Preliminary reports from 37 States for 52 weeks

	Cases
1925	28, 070
1926	25, 708
1927	28, 008

The population of these States was about 83,900,000 in 1925, and 87,600,000 in 1927.

During the last four months of the year 1927 the usual seasonal rise in incidence of smallpox occurred, but there were more cases than were reported in either 1925 or 1926. The following table gives a comparison of the preliminary telegraphic reports from 37 States for the last 20 weeks of the years 1925, 1926, and 1927.

Smallpox cases reported by 37 States for 20 weeks

Four weeks ended—	1927	Corresponding week	
		1926	1925
Sept. 10, 1927	493	448	382
Oct. 8, 1927	631	398	380
Nov. 5, 1927	982	761	712
Dec. 3, 1927	1, 920	1, 772	1, 463
Dec. 31, 1927	2, 598	2, 475	1, 646
Total	6, 624	5, 854	4, 583

Both the case rates and the death rates for smallpox vary widely from year to year. The disease now frequently occurs in epidemics which flare up suddenly when the infection is introduced into unvaccinated communities and die out when vaccination deprives the disease of susceptible material.

The following table shows the death rates per 100,000 in the registration area for deaths for the past 25 years, averaged by five-year periods:

Smallpox death rates per 100,000 in the death registration area

1902–1906	2.8
1907–1911	.2
1912–1916	.3
1917–1921	.5
1922–1926	.6

The lowest death rate during these 25 years was 0.1 in 1923, and the highest rate was 6.6 in 1902.

THE OXYGEN DEMAND OF POLLUTED WATERS

RUNNING WATER IS NOT ALWAYS PURE

With a persistence which entitles it to front rank among hygienic fallacies, the idea has long clung to the popular mind that running water, if not always pure, will at least purify itself "in a dozen miles or so." Disastrous consequences following too literal application of this erroneous principle to the selection of municipal water supplies has prompted numerous scientific investigations both here and abroad. A critical review of these researches with a bibliography of over 170 references is given in Part I of a publication entitled "The Oxygen Demand of Polluted Waters," by Chemist Emery J. Theriault, recently issued by the United States Public Health Service as Public Health Bulletin No. 173. Part II of the same bulletin is devoted to the presentation of an extensive series of experiments conducted in the stream pollution laboratories of the Public Health Service.

Briefly, it may be stated that a water contaminated with the organic matters found in sewage and in various industrial wastes does gradually rid itself of such pollution if allowed free access to air. Early studies of this phenomenon of self-purification led to the abandonment of a plausible theory based on the direct action of oxygen on the organic matters, and subsequent research extending over the past 50 years has revealed that the self-purification of streams is essentially a biological process. In this sense the oxygen contained in aerated or running water does not operate as a sterilizing agent, as once believed, but rather as a neutralizing or deodorizing agent for some of the gases resulting from the bacterial decomposition of the organic matters. Dissolved oxygen is also required for the maintenance of fish life. While thus relegated to a secondary rôle, the amount and rate of disappearance of the oxygen which is contained in a given water nevertheless serves as an excellent indicator, first of the threatened disappearance of fish life and, with increasing

pollution, as a warning of impending nuisance conditions. With the understanding that a bacteriological examination is a much better index of wholesomeness or fitness for drinking purposes, it has accordingly become customary to express the pollution of a given water in terms of its demand for dissolved oxygen when reference is made to the threatened disappearance of fish life or to the approach of nuisance conditions.

On the basis of extensive series of observations presented in Part II of Public Health Bulletin No. 173, it has become possible to give numerical expression to the actual rate at which the oxygen demand of a water is satisfied. The outstanding feature of this section of the report is that the rate at which the organic matter is oxidized, while strikingly uniform with a variety of waters, is exceedingly slow. Thus, in a given experiment with Ohio River water collected at Cincinnati, oxygen continued to be used up for fully 300 days and bacteria of intestinal varieties persisted for almost that length of time. Even in the absence of intervening pollution, it would be necessary to allow for a stream flow of several hundred miles before a water, once polluted, could regain its pristine purity. Irrespective of distance from the nearest upstream point of known pollution, it may be safely stated that no river in the United States can now be regarded as hygienically safe without treatment. Conversely, the possibility that a water polluted with sewage might be fully purified by flowing for "a dozen miles or so" becomes too remote for serious consideration.

From a more technical angle, the bulletin under discussion includes data relating to the rate of deoxygenation of polluted river water from which the velocity constants and the temperature coefficient of the underlying biochemical reaction have been computed by the least-squares procedure. The orderliness with which the reaction proceeds compares favorably with that of the purely chemical reactions thus far reported in the literature. This constancy of the rate of deoxygenation of polluted waters is also borne out when the oxygen demand values obtained at various cities are referred to a per capita basis. For the average community, the amount of oxygen required each day for the stabilization of its carbonaceous wastes will be in the neighborhood of 100 grams (0.22 pound) per capita. The findings in this respect are of especial significance, inasmuch as they indicate the possibility of making fair estimates of the ability of a stream to withstand pollution without giving rise to offensive conditions, by a calculation based solely on the contributing population and the volume of stream flow, and without resort to expensive laboratory investigations. Similarly, it would appear possible to estimate the minimum requirements in regard to the treatment of community wastes for the purpose of relieving existing

nuisance conditions. The per capita oxygen demand figure also enters into several other sanitary engineering computations.

Analytical and statistical methods of procedure are given in the four appendices.

This bulletin may be purchased through the Superintendent of Documents, Government Printing Office, Washington, D. C., at 25 cents per copy.

BRITISH COLONIES OF CEYLON, KENYA, AND NIGERIA JOIN INTERNATIONAL OFFICE

The Royal Italian ambassador has officially informed the State Department of the adherence as of January 1, 1928, of the British Colonies of Ceylon, Kenya, and Nigeria to the International agreement signed at Rome December 9, 1907, for the creation in Paris of the Office International d'Hygiène publique.

These colonies have adhered jointly as one unit and have asked to be entered in Class III, with the assessment quota of 15 units as their contribution to the expenses of the office, which will give them the right jointly to appoint a delegate on the Permanent Committee of the International Office.

EXPERIMENTAL BLACK TONGUE OF DOGS AND ITS RELATION TO PELLAGRA

By Joseph Goldberger and G. A. Wheeler, *Surgeons, United States Public Health Service*

CONTENTS

INTRODUCTION [1]

With the beginning of our investigations of pellagra, early in 1914, thought was given to the need for an experimental animal. Accordingly, at our suggestion, Surgeon Edward Francis, United States Public Health Service, beginning December 1, 1914, carried out a

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[1] By Joseph Goldberger.

feeding experiment in six rhesus monkeys at the United States Marine Hospital, Savannah, Ga. The diet fed those monkeys consisted of hominy grits, 900 grams (2 pounds); rutabaga turnips, dressed, 3.6 kilograms (8 pounds); sodium chloride, 11 grams (0.4 ounce); sirup (a commercial cane and corn compound), 565 grams (1.25 pounds). The feeding was carried on for eight months—that is, to July 31, 1915. Doctor Francis reported that the animals remained healthy, showing no change other than some loss in weight.

The possibility that the dog might serve our purpose first struck us in 1915, on reading in Chittenden's The Nutrition of Man, (1) among other things, the following:

* * * A dog transferred suddenly from a daily ration in which meat and milk are conspicuous elements to a diet in which these are wholly wanting is very liable to show disturbing symptoms almost immediately. One case may be cited in illustration of these statements. On September 29, 1905, dog No. 17, weighing 18.2 kilos was placed on a daily diet composed of 70 grams of fresh meat, 442 grams of milk, 300 grams of bread, and 28 grams of lard. This ration contained 9.06 grams of nitrogen and had a fuel value of 1,465 calories, or 0.5 gram of nitrogen and 80 calories per kilogram of body weight. On October 11 the animal weighed 18.6 kilograms and was in perfect condition. On the 13th the meat was reduced to 34 grams per day, but the milk was increased in amount so as to maintain the same nitrogen intake and fuel value as before. This diet was continued until November 3, a balance experiment covering 10 days from October 22 to 31, inclusive, showing that the animal was laying by a little nitrogen. On November 3 the diet was changed to milk, bread, and lard, the fuel value being maintained at 80 calories per kilo daily, while the nitrogen intake was reduced to 0.30 gram per kilo. On this diet the animal seemed to thrive perfectly, and at the end of two weeks showed a body weight of 18.2 kilograms. November 19 the milk was withdrawn, the bread being increased so as to keep the daily nitrogen intake and the fuel value unchanged. The day's food was now composed of bread and lard solely, but, as just stated, the nitrogen and fuel values were unaltered. In four days' time, however, a change began to creep over the animal; the appetite diminished, and there was apparent a condition of lassitude and general weakness which deterred the animal from moving about as usual.

During the next week the animal grew steadily worse, and would eat only when coaxed with a little milk or with bread softened with milk, the diet of bread and lard being invariably refused. There was marked disturbance of the gastro-intestinal tract; bloody discharges were frequent; the mucous membrane of the mouth was greatly inflamed and very sore; body weight fell off, and the animal was in a very enfeebled condition. This continued until December 4, with every indication that the animal would not long survive, but by feeding carefully with a little milk and occasionally some meat, improvement finally manifested itself, and by December 18 there was good appetite, provided bread was not conspicuous in the food. * * *

In all of the subsequent months, a small amount of meat was a part of the daily food, but as is seen from the table of balance periods, the total nitrogen intake and the fuel value of the food were reduced to even lower levels per kilogram of body weight. Yet the animal gained steadily, until at the latter part of June the weight was considerably above that noted at the commencement of the experiment in the preceding October. Further, the animal was in nitrogen equilibrium or even gaining nitrogen, and in perfect condition of health and

vigor, as is indicated by the accompanying photographs taken at the different periods stated. Especially to be emphasized is the fact that during the last six months of the experiment, the daily intake of nitrogen and the fuel value of the food were as low as or even lower than in November, when the daily diet was limited to bread and lard. The disastrous result which showed itself at once on this latter diet, with all animal food excluded, was not due to low proteid or to deficiency in fuel value, but simply to the fact that the animal for some reason could not adjust itself to a simple dietary of bread and fat, although there was ample available nitrogen and fuel value for the body's needs. Something was lacking, which meat or milk could supply, and this something was indispensable for the maintenance of the normal nutritional rhythm.

This is by no means an exceptional case, but we can cite many other examples of like results where the animal when restricted to a purely vegetable diet, such as bread, pea soup, bean soup, etc., reinforced by an animal fat, quickly passed from a condition of health into a state of utter wretchedness, with serious gastro-intestinal disturbance. * * *

The disturbance of the gastrointestinal tract with inflammation of the mucous membrane of the mouth was to us very suggestive of pellagra, a resemblance that was enhanced by the preventive and curative action attributed by Chittenden to meat and milk feeding, for we had already at that time been impressed with the evidence of a relation between diet and pellagra and with the therapeutic and preventive value of the fresh animal foods in the human disease (2).

Accordingly, at the first opportunity, which came late in the summer of 1916, one of us (J. G.), in association with Dr. Atherton Seidell, tried to repeat Chittenden's experiment in dogs with a bread and lard diet, but without significant result. It was not practicable to do anything more until the summer of 1918. In the meantime Chittenden and Underhill had published a report on "The production in dogs of a pathological condition which closely resembles human pellagra" by means of a diet of boiled peas, cracker meal, and cottonseed oil (3), so that on resuming the study Goldberger and Seidell tried feeding some dogs with the Chittenden-Underhill diet, but again without obtaining significant results. The one experiment that was made was carried on for but three months, at the end of which period it was again found necessary to interrupt this line of investigation.

Work on the problem of an experimental animal for pellagra was not again taken up until early in January, 1922. The dog was again selected for study, but the feeding, it was now decided, should be with a diet of the type that had been found associated with the occurrence of pellagra and believed to be pellagra producing. Accordingly, now in association with Surg. G. C. Lake, United States Public Health Service, the senior writer (J. G.) carried out the following experiment:

On January , 1922, six dogs began to be fed with a diet having the following composition:

Hominy grits	grams	200
Wheat farina	do	57
White rice	do	28
Cowpeas (California black-eye)	do	14
Milk (Pasteurized, market)	cubic centimeters	30
Lard	grams	21
Gelatine	do	40
Sodium chloride	do	10
Calcium carbonate	do	3
Cod-liver oil	cubic centimeters	28
Tomato juice (canned tomatoes)	do	115

The cowpeas were first cooked in tap water for 30 minutes, then the grits, farina (which was used as a substitute for wheat flour), rice, and salt were added and the cooking was continued in a double boiler for about another 40 minutes. At the end of this time the pot of food was withdrawn from the flame and the remaining ingredients were well stirred in. A suitable portion of this diet was served each dog once a day. With the idea of stimulating the appetite, a cake of commercial compressed yeast (about 15 grams) was offered each animal with its daily ration. As, in spite of this, the animals were not eating as well as was thought desirable, the allowance of yeast was later (June 14, 1922) doubled.

One of the six animals having developed an ugly temper, it was chloroformed on August 4, 1922. It had presented nothing of significance up to the time it was killed. On November 9, 1922, the feeding of the remaining five dogs was discontinued. All of them had lost weight and had developed sarcoptic mange, but none presented any other significant pathological change.

This failure, though in a sense disappointing, was not considered conclusive; it was therefore decided to repeat the experiment as soon as the animals were again in good condition.

The experimental feeding in dogs was resumed about the middle of January, 1923, and has been in progress ever since, now in association with the junior author (G. A. W.), who relieved Surgeon Lake about September, 1922, by reason of service exigency requiring the latter's assignment to other duty. In the present communication it is desired to report some of the results obtained.

EXPERIMENTAL FEEDING

EXPERIMENT 1

Our first experiment, essentially a repetition of the one carried out in 1922, was begun on January 16, 1923, with test diet No. 33. (Table 1.) In composition this was essentially the same as the diet used in the 1922 experiment, with the exception that it contained no milk and was not supplemented with yeast. Four days later, that is, on January 20, its composition was modified by reducing the amount

of the cod-liver oil and replacing it with cotton-seed oil, thus making diet No. 34 (Table 2), which was continued without further change to the end. This diet was constructed as a simplified replica of a type of diet found in our field studies in association with and (unless suitably supplemented) believed to be responsible for the occurrence of pellagra (4).

Diets associated with pellagra not infrequently contain some milk and a small amount of some meat; but since we had reason to believe that milk and meat possessed pellagra-preventive properties, and as we desired to work with as potent a pellagra-producing diet as possible, we thought best to exclude milk and meat altogether. As yeast does not ordinarily enter into the diet of the people subject to pellagra, even in their bread, it was thought best on general principles not again to use this even to stimulate the appetite. We had at that time no definite suspicion that it might possess pellagra-preventive action. We included gelatin, first, because we felt that the diet of a normally high-protein-feeding animal should perhaps contain more protein than the diet without some such element would afford, and, second, because at that time we were inclined to believe that the primary etiological dietary fault related to pellagra was an amino acid deficiency, and tests of gelatin in pellagra had already shown that it lacked beneficial therapeutic properties in that disease (4). Wheat farina was used as a substitute for wheat flour in order to avoid as much as possible giving the cooked food mixture a gummy character. The sodium chloride and calcium carbonate were included, with a view to improving the mineral content of the diet, and the cod-liver oil to supply an abundance of the vitamines that might be needed by animals that were to be confined indoors. Incidentally, the cod-liver oil was, in part at least, a substitute for the butter that is at times present in pellagra-producing diets. The canned tomato juice was assumed to be the equivalent of the variable fresh vegetable component of the type of diet ordinarily associated with pellagra.

Five dogs, numbered 1, 2, 5, 6, and 7, were used as test animals. Each animal was kept in a kennel in a room of one of the laboratory buildings. The sides and door of the kennel were of coarse wire screening on a wooden frame. The brick wall of the room formed the back. The floor of the kennel (that of the room) was of concrete. Horizontally across the back of each kennel, about a foot above the floor, there was fastened a board to serve as a bench. The kennel was cleaned daily by freely flushing with water. At irregular intervals the kennels were mopped with soap or disinfectant solution followed by water.

Each animal was provided with fresh drinking water daily, at first in an enameled pan, later in a galvanized iron pot. A weighed amount of the cooked food for one day was served in a similar recepta-

cle. What remained unconsumed at the end of 24 hours was weighed back and thus the daily food consumption was determined. The amount of food offered was, in general, all that the animal would eat.

The effect of this feeding is presented in detail for each animal in the following:

Dog 1.—Male. Acquired December 5, 1921; was one of the test animals in the feeding experiment of 1922.

January 16, 1923: In good condition; weighs 11.1 kilograms; begins test diet No. 33.

January 20: Begins test diet No. 34.

March 8: Food consumption markedly reduced during the past four or five days. There is present to-day a noticeable excess of saliva. The mucosa of the gums of the lower jaw and of the adjacent portions of the floor of the mouth shows irregular patches of congestion.

March 9: Weight, 9.5 kilograms.

March 10: Ate all his food yesterday. The salivation and the reddening of the buccal mucosa have subsided.

March 23: Eyes are slightly watery.

March 30: There is pronounced lachrymation. After a period of about five days from March 9 to March 14 during which the food consumption was consistently excellent, the food taking (appetite) became capricious and has oscillated considerably from day to day. There is present this morning a reddening of the mucosa of the upper lip and of the gums in the region of the oral commissures. The skin of the scrotum appears dry and some flaky desquamation is present. Weight 10.2 kilograms. Temperature at 10 a. m., 38.6°; at 8.45 p. m., 38.7°.

March 31: The skin of the scrotum is desquamating. Temperature at 12 m., 38.1°; at 8.30 p. m., 38.3°.

April 1: Eyes continue slightly watery. Temperature at 10 a. m., 37.7°; at 5 p. m., 38.4°.

April 2: The eyes are watery. There is slight congestion of the mucosa of the anterior portion of the floor of the mouth and of the cheeks. Slight buccal odor. Condition of scrotum unchanged. Weight 9.8 kilograms. Temperature at 12 m., 38.1°; at 5 p. m., 38.1°.

April 3: Over the anterior part of the central half of the skin of the scrotum there is present a slight streaky reddening and scaling. The posterior third of the scrotal skin is pigmented black so that it is not certain whether this is reddened, but there is present a slight but definite scaling over nearly the entire ventral aspect of the scrotum which appears dry. Condition of mouth unchanged. Has eaten very little during the past two days. Temperature at 10 a. m., 38.1°; at 4.45 p. m., 38.1°.

April 4: Scrotal lesion appears unchanged. At about the level of the line of occlusion of the teeth the mucosa of each cheek presents a brownish streak about 3 or 4 millimeters wide. This appears to represent an area of superficial necrosis. The mucosa of the base of the tongue, of the soft palate, and of the fauces appears somewhat similarly affected. Buccal odor is quite fetid. Temperature at 10 a. m., 38°; at 4.45 p. m., 38.3°.

April 5: The condition of the scrotum and that of the mouth are about as they were yesterday. Temperature at 10 a. m., 37.8°; at 4.30 p. m., 38.2°. Was offered about 200 cubic centimeters of fresh milk.

April 6: Condition of scrotum and mouth shows no marked change. Buccal odor continues fetid. Lapped a little of the milk offered. Weight 9.6 kilograms. Temperature at 10 a. m., 38.5°; at 4.30 p. m., 37.9°.

April 7: This morning the reddening of the buccal mucosa appears more pronounced than yesterday. The necrotic areas continue present. There is a moderate increase of saliva without drooling. Buccal odor continues fetid. Lapped but little if any milk since yesterday, but ate a little of the cooked food.

This afternoon there are found patches of redness on the mucosa of the upper lip on each side in the region of the canines. Temperature at 10 a. m., 38.8°; at 4.35 p. m., 38.5°.

April 8: The affected area of buccal mucosa has become more extensive and the inflammation more pronounced. Temperature at 11 a. m., 38.6°.

April 9: There is no notable change. Food consumption has for a week or more been quite irregular and small in amount. Had a hard bowel evacuation during last night. Temperature at 10.30 a. m., 38.2°; at 4.20 p. m., 39.1°.

April 10: The previously noted reddened patches on the mucosa of the upper lip have developed into a sharply delimited band on each side, extending from about the region of the canines back to the cheeks, where they merge in the reddened necrotic lesion of the buccal mucosa. There is slight drolling and pronounced buccal fetor. The skin of the scrotum appears more reddened, and desquamation continues. Had a large, partly formed bowel evacuation during the day. Temperature at 10.30 a. m., 39.1°; at 4.20 p. m., 39.8°. Temperature began to rise yesterday afternoon.

April 11: The inflammation of the mouth now includes the margin of the tongue. There is moderate drooling. Buccal odor is foul. Passed soft blood-stained stool at 4.30 p. m. Temperature at 9.30 a. m., 40°; at 4.20 p. m., 40.7°.

April 12: Has a weakened, dejected appearance this morning. Passed a diarrheal, blood-stained stool during the night with which he is extensively soiled. Buccal mucosa more severely inflamed and necrotic. Marked oral fetor and slight drooling are present. The scrotum shows a pronounced erythematous fringe along the anterior and lateral borders of the desquamating area. The posterior limit of this area is obscured by black pigmentation. There is increased drooling and there have been several diarrheal evacuations during the afternoon. Has eaten nothing since April 9. Temperature at 10 a. m., 40.7°; at 4 p. m., 40.9°.

April 13: Found dead at 7.30 a. m.

Necropsy.—A male fox terrier apparently in good state of nutrition. Weighs 8.3 kilograms. *Rigor mortis* is fairly established. Subcutaneous fat about normal. Skin of the scrotum is dry, red, and scaly. The anterior and lateral limits of the affected scrotal area are well defined; the posterior limit is obscured by dark, normal pigmentation.

The entire buccal mucosa, except that of the anterior portion of the tongue and hard palate, appears, on inspection, to be inflamed and necrotic. The same process involves the mucosa of the pharynx, nasopharynx, larynx, including the glottis and epiglottis, and of about the upper 2 inches of the esophagus. The necrosis seems to be more marked on the mucosa of the cheeks, the base of the tongue, and the soft palate.

The pleurae appear normal. There appears to be some congestion, probably hypostatic, at the base of the lower lobe of the left lung. There is a small hemorrhagic spot with whitish center on the surface of the upper lobe of the right lung. The lower border of the lower lobe of the right lung shows some hypostatic congestion.

The heart and pericardial membranes appear normal.

The liver, spleen, pancreas, kidneys, urinary bladder, and testes appear normal.

The stomach and intestines show an occasional small subserous capillary hemorrhage; otherwise they appear negative on external inspection.

Except for the involvement of the upper 2 inches, to which reference has been made, the mucosa of the esophagus seems normal.

The mucosa of the stomach is markedly congested, with submucous hemorrhages over a rather large area about the pylorus and along the greater curvature.

The small intestine contains a small amount of bile-stained mucus. Scattered throughout the upper half of this gut there are seen small submucous hemorrhages. These coalesce here and there to form small hemorrhagic patches.

The colon contains a small amount of yellowish, slimy mucus. The mucosa is congested and presents numerous submucous hemorrhages. The cecum is similarly affected, but to a lesser degree.

The rectum is empty and is markedly congested with numerous submucous hemorrhages throughout its length. The portion just within the anus presents what appears to be the same process as that seen in the buccal cavity.

Dog 2.—Male. Acquired December 5, 1921; was one of the test animals in the feeding experiment of 1922.

January 16, 1923: In good condition; weighs 8.5 kilograms; begins test diet No. 33.

January 20: Begins test diet No. 34.

February 23: Weight 7.3 kilograms.

March 8: Food consumption since the beginning of this month has been somewhat diminished as compared with that of February. The mucosa of the outer surface of the gums, both upper and lower on both sides, shows areas of redness. The mucosa of the cheeks also is reddened.

March 9: Weight, 8 kilograms.

March 10: The erythema of the mucosa of the gums and cheeks has faded almost completely.

March 22: Has been eating very little during the past five or six days.

March 23: Eyes are slightly watery. The scrotal skin is dry and desquamating in large flakes. Weight, 6.7 kilograms.

March 29: Has eaten little or nothing during the past three days. The mucosa of the upper lip, on both sides, is reddened. The mucosa of the cheeks and of the floor of the mouth is also reddened. All reddened areas have an angry appearance not unlike a severe pellagrous stomatitis. The reddening is not of uniform intensity, there being some patches almost hemorrhagic in appearance, with an irregular grayish surface film resembling a false membrane that is fairly easily wiped off. A fetid buccal odor is present. Buccal secretion is increased. The scrotum shows the remains of a dry, flaky desquamation.

March 30: Has eaten nothing during the past two days. Is lying down and appears disinclined to stand up. Has a listless and dejected look. Buccal odor is very fetid. The outer surface of the jaw is soiled with buccal secretion. The lower lip at the angles of the mouth seems slightly swollen and sags so that the reddened margin is exposed to view. At 5.20 p. m. forced to swallow a bolus containing 10 grams of Seidell's activated solid, immediately after which was seized with a convulsion of a clonic type. Five hours later was forced to swallow a second bolus containing 15 grams of activated solid.

The buccal mucosa is markedly reddened with many eroded spots and with a grayish-amber gelatinous accumulation over large areas of its surface. Has not eaten nor have bowels moved during the past 36 hours. Scrotal condition is unchanged. Temperature at 10 a .m., 40.9°; at 9.25 p. m., 40.7°.

March 31: Appears weaker. Is not eating. Drooling a stringy buccal secretion. Buccal odor continues foul. Buccal mucosa is inflamed, necrotic, and in places ulcerated. Passed a small hard stool coated with blood during the forenoon. About 8.30 p. m. vomited the boluses given yesterday. Passed a soft stool. Temperature at 12 m., 39.2°; at 8.30 p. m., 38.2°.

April 1: Found dead this morning.

Necropsy.—The skin of the scrotum is freshly desquamated with a few partly adherent, thin, dry scales about the periphery. Otherwise, there is nothing of importance on inspection.

The upper surface of the tongue is not appreciably changed from the normal, but the margins at about the interdental space are intensely congested. The under surface of the tongue is congested and of a dark blue color. The floor of the mouth is intensely congested. The pharyngeal, naso-pharyngeal, and laryngeal mucosa and the base of the tongue are intensely congested and present patches of superficial necrosis, as indicated by the presence of patches of a grayish membrane. The hard palate is not appreciably affected. The soft palate is intensely congested. The intensely inflamed mucosa of the lips, gums, and cheeks has a grayish necrotic appearance.

The right lung shows some congestion at the apex and at the base of the middle and lower lobes. The left lung shows hypostatic congestion. The heart seems normal.

The liver, spleen, pancreas, and kidneys appear normal.

The mucosa of the esophagus appears slightly congested. The stomach contains some liquid in which there is a little of what appears to have been part of the bolus of activated solid administered in the evening of March 30. The mucosa presents irregular intensely congested patches near the pylorus and along the lesser curvature.

The small intestine contains a small amount of bile-stained fluid. The upper and middle portions present small irregular patches of congested mucosa.

Under the peritoneal surface of the upper part of the colon there are punctate hemorrhages. Corresponding to the sites of these are seen patches of markedly congested mucosa. The mucosa of the rectum appears normal.

The mucosa of the fundus of the urinary bladder appears congested.

Dog 5.—Bitch. Acquired November 8, 1921; was one of the test animals in the feeding experiment of 1922.

January 16, 1923: In good condition; weighs 8.6 kilograms; begins test diet No. 33.

January 20: Begins test diet No. 34.

January 26: Has been in heat for past three days.

March 23: Weight, 8.3 kilograms.

March 30: Buccal mucosa possibly somewhat reddened. There are four dirty grayish irregular patches on the mucosa of the upper lip; one opposite each canine tooth. Food consumption (appetite) has been much reduced during the past 10 days. Weighs 7.5 kilograms.

No indication of bowel action to-day. Temperature at 10 a. m., 38.6°; at 8.55 p. m., 38.3°.

March 31: No notable change. Temperature at 12 m., 38.5°; at 8.30 p. m., 38.3°.

April 1: No notable change. Temperature at 10 a. m., 38.3°; at 5 p. m., 38.5°.

April 2: Buccal mucosa is inflamed with a necrotic process affecting an antero-posterior elongated area in the region of the molar teeth. Markedly fetid buccal odor is present. Has eaten nothing since March 28. Weight, 7.1 kilograms. Temperature at 12 m., 38.2°; at 5 p. m., 38°.

April 3: The lips and gums show increased redness. The posterior portion of the dorsum of the tongue and the soft palate are decidedly reddened. Had a loose bowel movement during the night. Temperature at 10 a. m., 37.6°; at 4.45 p. m., 38.1°.

April 4: There is some drooling of saliva. Seems weaker. Had a clonic convulsion about noon lasting one-half to one minute. Not eating. Temperature at 10 a. m., 38.1°; at 4.45 p. m., 38.5°.

April 5: Condition not notably changed. Temperature at 10 a. m., 38.6°; at 4.30 p. m., 38.5°. Not eating.

April 6: Appears less dejected. Salivation less marked. Not eating. Weight, 6.8 kilograms. Temperature at 10 a. m., 38.5°; at 4.30 p. m., 38.5°.

April 7: No notable change in condition. Passed small, semiliquid stool during the night. Has eaten nothing since March 28. Temperature at 10 a. m., 38.4°; at 4.35 p. m., 38.6°.

April 13: No notable change in condition during the past week. Not eating. Becoming noticeably emaciated. Weight, 6.1 kilograms. Temperature at 10.20 a. m., 38.3°; at 4.20 p. m., 38.6°.

April 14: Seems weaker. There is a perceptible increase in buccal secretion but without drooling. Condition of buccal mucosa about as previously noted, but the necrotic areas seem to have become somewhat cleaner during the past few days as if tending to heal. Passed a dark, semisolid stool during the night.

The afternoon examination shows evidence of a definite increase in buccal secretion, nearly all of which is apparently swallowed. There is also present a beginning reddening of the labiogingival fold of the upper lip on both sides in the region opposite the canines and the interdental spaces. The mucosa of the cheeks, especially that just back of the angles of the lips, also shows a definite increase in redness. Temperature at 10.30 a. m., 38.2°; at 4.15 p. m., 38.6°.

April 15: The changes in condition observed yesterday afternoon are all more pronounced this morning. In addition, oral fetor has become marked. Very slight drooling. Passed a small, dark-colored semisolid stool this morning. Has eaten nothing since March 28. The test diet is discontinued. Was induced to eat about 20 grams of finely ground fresh lean beef. Temperature at 10 a. m., 38.6°.

April 16: About as noted yesterday except for a possible further increase in the redness of the mucosa of the cheeks and of the upper lip. Passed two diarrheal stools during the night. Was induced to take about 100 grams of fresh beef during the day; ate nothing else. Temperature at 10 a. m., 38.4°; at 4 p. m., 38.6°.

April 18: Has voluntarily taken a little cooked food containing some fresh beef. General condition seems better. The condition of the buccal mucosa seems better, less red.

April 20: There has been a pronounced change for the better in the condition of this animal during the past 36 hours. The inflamed condition of the mouth has improved markedly. Buccal odor much less fetid. Salivation has ceased. Appears livelier than for some time. Eating better of the cooked food containing fresh beef. Has gained slightly in weight during the past week. Weight 6.4 kilograms.

April 27: Condition of the mouth is again about normal. Bowel movements normal. Further history not relevant.

Dog 6.—Bitch. Acquired December 15, 1921. Was one of the test animals in the feeding experiment of 1922.

January 16, 1923: In good condition; weighs 12.6 kilograms; begins test diet No. 33.

January 20: Begins test diet No. 34.

February 14: Threw a litter of 6 pups, 2 of which were dead and macerated; the other 4 died within 24 hours.

March 30: Food consumption (appetite) has been somewhat reduced during the past week. Weighs 10.9 kilograms. The mucosa of the upper lip shows on both sides a sharply delimited band of erythema which in width extends from a little within the free margin of the lip to the labiogingival fold and, in length, from the median line to about the region of the labial commissures. Temperature at 10 a. m., 39.1°; at 9.10 p. m., 38.8°.

March 31: Buccal mucosa about as yesterday. Temperature at 12 m. 39.2°; at 8.30 p. m., 38.8°.

April 1: Reddened bands on upper lip appear about as already noted but there has developed in the past 24 hours a small oval dirty patch on each side in region of apposition to canines. Fetid buccal odor is present. Refused all food yesterday. Temperature at 10 a. m., 39°; at 5 p. m., 39.1°.

April 2: No notable change in condition of the mucosa of the upper lip. The mucosa of the cheeks and the posterior portion of the margin of the tongue have become red. Fetidity of buccal odor is marked. Ate nothing yesterday. Weighs 10.5 kilograms. Temperature at 12 m. 38.9°; at 5 p. m., 39.3°.

April 3: The mucosa of the cheeks presents an irregular patch of superficial necrosis. Ate a small amount of food yesterday. Temperature at 10 a. m., 39.6°; at 4.45 p. m., 38.1°.

April 4: During the past 16 hours the inflammation of the buccal mucosa has taken on a more angry appearance. There have appeared here and there over the affected area brownish necrotic patches of varying form and extent. This process is now present across the mucosa of the soft palate and on that of the upper lip. Buccal secretaion is increased; odor is fetid. Ate a small amount of food yesterday. Temperature at 10 a. m., 40.3°; at 4.45 p. m., 40.0°.

April 5: Ate nothing yesterday. Buccal secretion is profuse; odor is strong. Mouth more markedly affected. The tip and lateral margins of the tongue are reddened. Temperature at 10 a. m., 40.3°; at 4.30 p. m., 40.4°.

April 6: Inflamed condition of the mouth appears to have become more marked; drooling is excessive; odor marked. Ate nothing yesterday. Weighs 9.8 kilograms. Temperature at 10 a. m., 40.3°; at 4.30 p. m., 40.5°.

April 7: Condition of the buccal mucosa has become worse. There is decided increase in the redness of the margin of the tongue, including a narrow strip (about 3 or 4 millimeters wide) of the dorsal aspect of the margin all the way around including the tip; marked drooling of blood-tinged secretion. Buccal odor extremely foul. Has eaten nothing in 72 hours. Temperature at 10 a. m., 40.1°; at 4.35 p. m., 39.4°.

April 8: General condition and mouth symptoms seem worse this morning. Not eating. Temperature at 11 a. m., 36.6°.

April 9: Found dead about midnight last night.

Necropsy.—An apparently well-nourished fox terrier bitch.

The fur of the legs, tail, and sides extensively soiled with saliva. Marked fetid odor about the mouth. Both eyes sunken. Subcutaneous fat abundant.

The mucosa of the lips, gums, floor of the mouth, of all of the tongue except a median strip of the anterior portion of the dorsal surface, of the pharynx, posterior portion of the naso-pharynx; of the larynx, including the glottis and epiglottis and of the soft palate is intensely inflamed and necrotic, with a dirty yellowish slimy layer of necrotic mucosa throughout most of these parts.

The left lung appears normal; the right shows areas of hypostatic congestion in portions of all three lobes. The trachea and larger bronchi seem normal. The pericardium and heart are apparently normal.

The liver, pancreas, and kidneys seem normal. The spleen is perhaps smaller than normal; the central portion is, perhaps, slightly contracted. There are many irregular dark-blue patches scattered throughout.

There is slight injection of the mucosa of the lower portion of the esophagus particularly near the cardiac orifice.

The stomach contains a small amount of bile-stained mucus. The mucosa is slightly injected near the pylorus and along the greater curvature.

The small intestine contains a small quantity of yellowish slimy mucus in places tinged with blood. Along about 3 inches of its length at about the junction of the upper and middle thirds there are scattered some punctate hemorrhages. There are diffuse submucous hemorrhages in the upper portion with here and there circumscribed areas with apparently a beginning necrosis.

The colon contains a small amount of soft, blood-stained feces. The mucosa of the upper portion, including the cecum, is injected, possibly with fine submucous hemorrhages.

The rectum is partly filled with semisolid feces. There is slight congestion of the mucosa near the anal orifice.

The urinary bladder is contracted with the mucosa of the fundus slightly injected.

Genitalia, apparently normal.

Dog 7.—Male. Acquired December 29, 1922.

January 16, 1923: In good condition; weighs 16.8 kilograms; begins test diet No. 33.

January 20: Begins test diet No. 34.

February 9: Eating well. Weighs 18.4 kilograms.

March 9: Nothing notable. Weighs 19.1 kilograms.

March 23: Food consumption has been considerably diminished during the past week. Weighs 19.7 kilograms.

March 29: Food consumption has continued at a reduced though irregular rate. There is some salivation present this morning. The mucosa of the mouth is generally flushed, with marked reddening of that portion of the mucosa of the upper lip that is in opposition to the gum. This reddened area is clearly delimited from the rest of the mucosa of the lip. The mucosa of the soft palate also is notably reddened. A foul buccal odor is present. The nose is moist and there is slight lachrymation.

March 30: The animal appears decidedly weaker than yesterday; disinclined to get up on feet. Eyes are moist; the conjunctivae are reddened. A slight watery nasal discharge is present. There is pronounced drooling of ropy saliva. The lower lip at the angles sags so that the reddened margin is exposed and permits the stringy buccal secretion to flow out. The mouth is more inflamed. The margin and base of the tongue are inflamed but the dorsal surface is not appreciably altered. The anterior portion of the scrotal skin shows a slight reddening and bran-like desquamation. At 5.20 p. m. given 10 grams of Seidell's activated solid in a bolus of graham flour, cornstarch, and cottonseed oil. At 10.10 p. m. given a second bolus containing approximately 15 grams of Seidell's activated solid. Weighs 18.1 kilograms. Temperature at 10 a. m., 39.9°; at 9.35 p. m., 40.7°.

March 31: Has hiccough this morning. Is drooling copiously. Buccal odor is very foul. Has eaten little or nothing during the past three days. Given about 200 cubic centimeters of milk by drench. Temperature at 12 m., 40.2°; at 8.30 p. m., 40.7°.

April 1: Appears considerably weaker. Ate nothing yesterday other than the milk given by drench. Buccal mucosa is more necrotic. The scrotum continues to show desquamation with the anterior and anterolateral margins of the affected area well defined. Had a diarrheal stool last night. Temperature at 10 a. m., 39.5°; at 5 p. m., 39.5°.

April 2: Found dead this morning.

Necropsy.—A large, seemingly well nourished male. Rigor well established. The fur about the mouth is soiled, apparently with buccal secretion; there is a foul odor from the mouth. Sclerae are markedly injected. The anterior part of the scrotum shows an area of erythema and desquamation which is sharply delimited anteriorly.

A considerable subcutaneous fat layer is present.

The mucosa of the upper lip shows evidence of severe inflammation; irregular areas have undergone a necrotic process which gives the appearance of a false membrane. A similar process has affected the mucosa of the lower lip, of the cheeks, of the margin, under surface and posterior portion of the dorsum of the tongue, of the soft palate, of the pharynx, naso-pharynx, larynx, glottis, and epiglottis.

There are fine subpleural ecchymoses below the fourth intercostal space. The left lung is collapsed and shows small areas of hypostatic congestion and consolidation near the margin of the lower lobe.

The upper lobe of the right lung seems normal. The middle lobe of this lung is consolidated and there are small areas of consolidation in the lower lobe. Section of the consolidated areas shows small grayish patches.

The pericardium shows fine capillary hemorrhages. The epicardium shows similar hemorrhages which appear most marked over the interventricular groove and coronary areas.

A rather large quantity of fat is present in the omentum. There are to be observed very fine subserous hemorrhages scattered throughout the length of the intestine.

The liver is about of normal size and is perhaps slightly congested. The kidneys and spleen seem normal. The pancreas presents a suggestion of very fine capillary ecchymosis.

The esophagus appears normal. The vessels of the stomach are injected with what seem to be fine subserous hemorrhages. The mucosa is markedly congested particularly in the pyloric region. The organ contains a small amount of dark green, foul smelling liquid.

Along the middle portion of the small intestine there are scattered small submucous hemorrhages which are more marked in the upper part.

The mucosa of the cecum seems slightly injected; whip worms are present. The large gut is practically empty; its mucosa is injected throughout with numerous fine capillary hemorrhages.

The urinary bladder is contracted. It contains a small amount of urine. There is considerable injection of the mucosa of the fundus.

Testes are apparently normal.

Thus, in from 51 to 73 days after beginning the test, all five animals developed a condition which, certain variations aside, had the same outstanding characters in each. Four of the dogs died; one recovered.

The animals, when sick or at postmortem, or both, were also seen by Drs. Leigh T. Giltner and Jacob E. Shillinger of the Bureau of Animal Industry of the United States Department of Agriculture, and by Dr. M. R. Blackstock, veterinarian, of Spartanburg, S. C. All agreed with us that the condition presented was clinically indistinguishable from that occurring spontaneously in dogs and known to American veterinarians as black tongue.

Athough the study which may be said to have been initiated by the foregoing experiment has been carried on steadily ever since, nearly

four years elapsed before experiment 1, as such, was actually repeated. In its repetition it was found convenient to construct the test diet on a 2,400 instead of the original 1,620 calorie basis, and to use a corn meal of a slightly different character. The test diet was therefore given a different serial number, namely No. 288. (Table 3.) The essential details of the experiment as repeated are set forth in the following:

EXPERIMENT 2 [2]

The methods of caring for, feeding, and observing the test animals were essentially the same as described under experiment 1. Five dogs, numbered 38, 44, 50, 93, and 97, were the test animals. The effect of this feeding is presented in the following for each of the animals:

Dog 38.—Male. Was one of a litter whelped in the laboratory June 26, 1923. Served in various experiments (see experiment 3) and suffered several attacks of experimental black tongue,[3] the latest beginning July 19, 1924. On stock diet No. 156 (Table 4) from March 15, 1927, to April 6, 1927.

April 6, 1927: In good condition; weighs 11.5 kilograms. Begins experimental diet No. 288.

May 3, 1927: Food consumption has been excellent; weighs 12 kilograms.

May 7: Food consumption has continued excellent. Presents a distinctly reddened band or streak about 2 millimeters wide and about 1 centimeter long on the mucosa of the upper lip on each side in the region of the molar teeth. On the right side there is also a reddened irregular circular patch opposite the canine teeth.

May 8: The reddened streaks on the mucosa of the posterior part of the upper lip of each side have extended forward appreciably. The mucosa of the floor of the mouth is slightly injected. Mouth is otherwise about as yesterday. Temperature at 10 a. m., 37.7°.

May 9: The mucosa of the upper lip presents, on the right side, a row of three well-marked and vividly red patches, the middle one of which is opposite the canine teeth; on the left side it likewise presents a row of three reddened patches but these are not so sharply outlined nor so bright as those on the right side. The mucosa of the floor is definitely injected. Temperature at 10.20 a. m., 39.2°.

May 10: The mucosa of the right side of the upper lip continues about as yesterday except that the posterior one of the reddened patches has elongated somewhat and is now continuous with a reddening of the mucosa of the cheek. The reddened patches on the left side of the upper lip are less distinct than yesterday except the posterior one, which has likewise elongated and become continuous, with a flushing of the mucosa of the corresponding cheek. The mucosa of the floor of the mouth continues injected and the anterior faucial pillars have become somewhat reddened. Food consumption continues excellent; weight is 12.2 kilograms. Temperature at 10.32 a. m., 38.9°.

May 11: Mouth appears about as it did yesterday. Temperature at 10.10 a. m., 38.8°.

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[2] By Joseph Goldberger and L. M. Rogers.

[3] This designation of the experimental disease is here used as a matter of convenience and without prejudice to the question of its identity with the spontaneous disease of this name, presently to be considered.

May 14: The red patches on the mucosa of the upper lip tend to coalesce and to form a band on both sides. The floor of the mouth continues injected. Food consumption was excellent until yesterday when for the first time in fully a month a portion of the daily allowance was left. Temperature at 10 a. m., 38.4°.

May 15: The mucosa of the upper lip on each side now presents a bright red band extending from the cheeks forward to the median line. The cheeks, anterior pillars, and floor of the mouth have become notably more red. There are present small areas of superficial necrotic membrane within the reddened areas on the mucosa of the upper lip; the mucosa of each cheek is fairly well covered with a similar membraneous film. Ate less than half of the food allowance yesterday. Temperature at 9.30 a. m., 39.7°.

May 16: Mouth lesions are about as yesterday but seemingly not so vividly red. The margins of the tongue are reddened and necrotic. There is some salivation and a foul buccal odor is present. Ate nothing yesterday. Temperature at 9.35 a. m., 40.4°; at 2.30 p. m., 40.5°.

May 17: Condition of the mouth is about as yesterday. Not eating. Weighs 10.8 kilograms. Temperature at 8.50 a. m., 41°; at 3.15 p. m. 40.8°.

May 18: Inflamed and necrotic condition of mucosa of lip and mouth is, if anything, more pronounced. Salivation is more pronounced. Seems depressed and weak. When taking the morning temperature the bulb of the thermometer was soiled with thin, brownish feces. At 5 p. m. vomited a moderate amount of thin mucoid fluid. Not eating. Temperature at 9.15 a. m., 41°; at 2.55 p. m 41.6°; at 5 p. m., 41.2°.

May 19: Found dead this morning.

Necropsy.—A seemingly well-nourished animal with a moderate layer of subcutaneous fat and a fair amount of omental and perirenal fat.

The mouth is as observed during life, but the affected mucosa appears here and there of a dark blue tint.

The esophagus presents nothing of note. There is some injection of the gastric mucosa near the pylorus. The small intestine contains some yellowish brown mucous and two or three hookworms. The large intestine presents nothing of special note; the distal portion contains some semisolid feces.

The liver, pancreas, spleen, and kidneys present nothing of note.

The pleural cavities appear normal. The lungs are crepitant, but the right middle lobe and the lower anterior portion of the left upper lobe each presents a dark blue patch of congestion.

The heart and pericardium present nothing of note.

Dog 44.—Male. Was one of litter whelped in the laboratory June 26, 1923. Served in various experiments and suffered several attacks of experimental black tongue, the latest beginning February 4, 1926. On stock diet No. 156 (Table 4) from March 15, 1927, to April 6, 1927.

April 6, 1927: In good condition; weighs 11.8 kilograms. Begins experimental diet No. 288.

May 27: Food consumption has been excellent. On the ventral aspect of the scrotum there is present at about the center an irregular erythematous patch about 2 centimeters in diameter; to the right of this is present another similar but smaller patch.

May 29: The smaller scrotal patch of erythema has faded out while the larger has paled somewhat.

May 30: Scrotal erythema has not notably changed.

May 31: Has continued to eat well. Weight has oscillated between 11.4 and 11.8 kilograms.

June 1: The scrotal erythematous patch seems to have faded at the center and to have extended somewhat peripherally so that there is now present an irregular ringlike band, the band being about 1 centimeter in width.
June 3: The scrotal erythema is again in the form of an irregularly circular patch, the center of the ring having become reddened. The affected skin is dry, with some accumulation of a dried material, possibly of serous exudate.
June 5: Scrotal lesion less red and there is a beginning exfoliation of large flakes.
June 7: Periphery of scrotal lesion is again reddened; desquamation is in progress.
June 10: Scrotal lesion is much less red; desquamation is nearly completed except for a few adhering tabs at the periphery of the lesion.
June 12: Scrotal lesion persists without notable change.
June 13: Scrotal lesion not so red as yesterday.
June 14: Area involved by scrotal lesion has extended and is more red than yesterday.
June 17: Scrotal lesion continues red; there is some desquamation.
June 19: Desquamation of scrotal lesion continues and is in large flakes.
June 23: Scrotal lesion not quite so red as it has been during the past few days, but some redness and desquamation continue in evidence.
June 24: Nearly the entire ventral aspect of the scrotum has become more diffusely reddened. The lesion is sharply delimited. The erythema is more marked at the periphery and there are present some adhering desquamative flakes at points near to or at the periphery.
June 25: The scrotal erythema is less diffuse. Here and there at the periphery of the lesion there are adherent, yellowish flakes, or scales, on an erythematous background.
June 27: The scrotal lesion is less red than it was two or three days ago. Desquamation has increased. Food consumption has been consistently excellent and the weight has been well maintained.
June 30: The scrotal lesion is covered by a brownish yellow epidermal layer that is readily pulled off exposing a glistening new skin beneath. Tabs tend to adhere along the periphery.
July 4: The scrotal lesion presents the appearance of a fairly diffuse reddening affecting almost all of the scrotal surface. The erythema is fairly sharply outlined, but the limits are not clearly perceptible caudally and at the sides on account of the fur.
July 5: The scrotum is reddened, dry, and rough. There is some scaling especially about the margins of the reddened area.
July 8: The scrotum is desquamating in flakes.
July 11: The scrotum is practically normal again.
July 13: The scrotum presents an erythematous mottling.
July 14: Area of scrotal erythema is more extensive.
July 17: The caudal half of the scrotum is erythematous, but the central portion of the affected area presents a yellowish appearance which is found to be due to an epidermal layer that peels off. Presumably this is an exfoliation following an antecedent erythema. Beneath this exfoliating membrane the skin is pale and glistening. Thus the erythema forms a roughly-encircling mottled band about the central exfoliating area.
July 19: The irregular ring-like erythematous band is more red. Anteriorly it presents several eroded patches.
July 20: The entire caudal half of the scrotum is diffusely reddened. There are several large yellowish epidermal flakes attached along the anterior margin of the lesion. The erosions noted yesterday are dry and covered with yellowish crusts. Continues to eat well; weight continues to be well maintained.

July 21: Scrotal erythema less marked; desquamation continues.

July 22: Scrotum seems again of about the normal color but large, dry, yellowish flakes still adhere along the periphery.

July 26: Scrotum continues to desquamate and presents freshly reddened patches at about its center. Food consumption continues excellent. Weighs 12.2 kilograms.

July 27: The scrotal skin is a mottled red. There is only a little desquamation and that at the periphery of the lesion.

July 29: The patchy erythema of the scrotum has become more pronounced.

August 1: The scrotum again is desquamating in large flakes but redness has markedly lessened. Opposite each canine tooth the mucosa of the upper lip presents a suspicious faintly reddened patch.

On July 27, for the first time since the beginning of the experiment, left some (about one-fifth) of the daily ration; on July 29 refused all food; on July 31 again left a small portion of the daily ration.

August 2: On each side of the upper lip there is now a row of small discrete reddened patches. The floor of the mouth is slightly injected. The scrotum is about normal. Weighs 11.8 kilograms. Temperature at 3 p. m., 39°.

August 3: Erythematous patches on the upper lip are brighter. Floor of mouth is more red. Temperature at 10 a. m., 39°; at 3 p. m., 39°.

August 5: Erythematous patches on upper lip have faded somewhat. Temperature at 9.20 a. m., 38.6°; at 3 p. m., 38.6°.

August 6: The mucosa of the upper lip again presents a row of reddened patches on each side. The floor of the mouth is about normal in appearance. Left eye presents a conjunctivitis with considerable lachrymation. Scrotum is about normal.

August 8: Except for a small reddened patch on each side of the upper lip, posteriorly, the mouth is again about normal. The left eye is still watering.

August 10: The ventral aspect of the scrotum again presents an irregular reddened patch. Mouth practically normal in appearance. Left eye is watering.

August 13: The erythema of the scrotum is well marked and has extended peripherally so that it involves all but the most anterior portion of the scrotum. The left eye is still lachrymating.

August 14: The scrotal lesion is about as noted yesterday except that scattered about within the affected area are small yellowish patches. Has eaten well since the first of the month.

August 16: Mild conjunctivitis of left eye persists. The affected scrotal skin appears dry and stiff.

August 18: Scrotal erythema is less marked.

August 19: Scrotal lesion presents a flaky desquamation.

August 20: Both eyes are watering. The scrotal lesion is desquamating. The new underlying skin thus exposed is a mottled red.

August 21: The scrotal lesion has adherent flakes at the periphery. The newly exposed skin is red and presents a number of scattered yellowish, superficially necrotic-looking patches.

August 23: Scrotal lesion is not so red; the scattered necrotic patches seem more extensive. Not eating so well; has refused some food on 5 of the past 10 days. Weight is well maintained.

August 25: Scrotum of normal color except for some crusts at the sites of superficial necrosis; still some adhering tabs along periphery of the lesion.

August 27: Eyes are less watery; scrotum is healing.

August 30: Scrotum is about normal; eyes continue to water; left some food once during past week. Weighs 12 kilograms.

September 1: On the mucosa of the upper lip there is present on each side a sharply outlined reddened band extending from the median line back to the cheeks. The width of the bands is not uniform throughout. The mucosa of the cheeks and the anterior pillars is slightly flushed. The floor of the mouth is reddened.

Has eaten all of the daily ration offered during the past five days. Eyes are still watering. A portion of the left half of the scrotum is slightly mottled red.

September 3: Mouth is not so red. The erythematous mottling of the left side of the scrotum is more pronounced and more extensive.

September 4: Mouth is again about normal in appearance. Eyes continue to water. Scrotal lesion is perhaps less bright.

September 5: The affected scrotal skin has acquired a parchment-like, smooth, yellowish brown appearance.

September 8: Eyes continue to water. Erythema of scrotum is more extensive.

September 9: The mucosa of the upper lip presents on both sides a faint but definite erythematous band. Eyes are watering and there is slight photophobia. Scrotal lesion continues as already noted.

September 10: Erythematous bands on the upper lip are quite bright and sharply outlined. They extend from the median line back to the cheeks which are slightly flushed The mucosa of the floor of the mouth is slightly injected. The affected scrotal skin has a glazed appearance. There is a desquamation beginning over the patches recorded a few days ago as having become pigmented. Along the periphery of the lesion the erythema forms a fairly definite more deeply red encircling zone or band.

September 11: The erythematous bands on upper lip have faded to a considerable degree especially on the right side. The cheeks and floor of the mouth are about normal. Eyes and scrotal lesion not notably changed.

September 13: Mouth is about normal again. The eyes are watering. Very nearly all of the erythematous area of the scrotum has become more or less keratosed and some of its seems pigmented a brownish yellow; desquamation is pronounced. The scrotal lesion has all the well-recognized characters of a pellagrous dermatitis, including a narrow zone of a more pronounced erythema at the periphery of the lesion.

September 16: The erythema of the scrotal lesion has nearly completely faded; the desquamation of a flaky character has made considerable progress, leaving a shiny new skin.

September 19: Eyes continue watery as already repeatedly noted. Desquamation of scrotal lesion has made further advance.

September 20: During the past two weeks has with increasing frequency left some food unconsumed. Weight is 12.1 kilograms and has, thus, been well maintained.

September 22: The mucosa of the upper lip on each side presents a faint but definite, unevenly reddened band. Eyes are watery. The scrotal lesion presents some peripherally adhering tabs.

September 23: The erythematous bands on the upper lip are more definite.

September 24: The erythematous bands on the upper lip are bright and well marked. Mucosa of the cheeks is slightly flushed. The vessels of the mucosa of the floor are engorged. The margins of the tongue, on each side, just back of the tip, are reddened. The scrotal lesion still presents adherent exfoliating epidermal tabs.

September 25: The bands on the upper lip have faded to a very considerable degree. The mucosa of the cheeks is about normal. The floor of the mouth, the scrotum, and the eyes continue about as last noted.

September 27: Erythematous bands have reappeared on the upper lip. On the right side of this lip at about the angle of the mouth there is present a patch of superficial necrosis of the mucosa. On the left side there are several small necrotic patches at about the center of the erythematous band. The floor of the mouth is reddened; the cheeks and anterior pillars are flushed. The left eye is reddened and watery. During the past week some food has been left on all but one of the days. Weight is 11.9 kilograms. Temperature at 10.30 a. m., 39.1°.

September 30: The bands on the mucosa of the upper lip are wider and a deeper red. The mucosa of the cheeks presents patches of necrosis. The margins and the tip of the tongue are more red. There is slight salivation and a foul buccal odor is present. Eyes are watery. Scrotum is negative.

October 1: Food consumption has diminished further. Temperature at 2 p. m., 39.3°.

October 2: The patchy superficial necrosis of affected areas on lip, cheeks, and floor of the mouth is more pronounced. Salivation has increased. Temperature at 9.30 a. m., 39.6°.

October 3: Necrotic process affecting the mucosa of the mouth is still more marked and a pseudo membrane is forming; the lesions are perhaps less red. Has eaten very little during the past 48 hours. Temperature at 10 a. m., 40.8°.

October 4: Food consumption has diminished progressively during the past week. Ate almost nothing yesterday. Weight 10.4 kilograms. Temperature at 9.45 a. m., 40.1°.

October 5: Mouth is necrotic and foul. Lips are stained with a yellowish fluid, probably vomitus. Ate nothing in past 24 hours. Lying quietly in kennel. Temperature at 11 a. m., 36°.

October 6: Died sometime during the night.

Necropsy.—(Partial). A seemingly well-nourished animal with good layer of subcutaneous fat. Inspection of thoracic and abdominal organs shows no gross inflammatory process.

Dog 50.—Male. Acquired September 25, 1923. Served in various experiments and suffered several attacks of experimental black tongue, the latest beginning March 16, 1926. On stock diet No. 156 (Table 4) from March 15, 1927, to April 6, 1927.

April 6, 1927: In good condition, weighs 12.9 kilograms. Begins experimental diet No. 288.

April 19: Some food left well nigh daily during the first week of the test diet. Has eaten all food offered daily during past five days. Weight is 12.8 kilograms.

May 3: Food consumption has been irregular during the past week. Weight is 12.6 kilograms.

May 8: Presents a slight reddening of the mucosa of the floor of the mouth.

May 9: Mouth appears normal.

May 16: Mucosa of the floor of the mouth is probably slightly reddened.

May 17: During the past two weeks some food has been left five times. Weight is 12.5 kilograms.

May 18: The mucosa of the upper lip presents a row of erythematous patches on each side. The floor of the mouth is distinctly reddened.

May 19: Each side of the upper lip presents a well marked reddened band extended from the median line back to the cheeks, the mucosa of which is flushed. The floor of the mouth is distinctly injected. Has been leaving some food daily during the past three days. Temperature at 9 a. m., 37.6°; at 3 p. m., 37.6°.

May 20: Mouth is about as noted yesterday except that the anterior faucial pillars are injected. Temperature at 11 a. m., 39.1°

May 21: The bands on the upper lip are but little changed, if anything they are less bright. There appears to be some superficial necrosis over the central portion of the mucosa of the cheeks. Mucosa of the floor of the mouth less red. Temperature at 9.40 a. m., 38.6°.

May 22: The bands on the mucosa of the upper lip have well nigh completely faded as such, but there are present on each side within the previously affected area a row of three or four reddened patches which are particularly marked on the left side. Mucosa of the cheeks continues flushed. Temperature at 10 a. m., 39.5°.

May 23: Mouth lesions appear much as they did yesterday except that the reddened patches on the upper lip seem more marked. There is present a foul buccal odor. Ate nothing yesterday. Temperature at 10 a. m., 39.2°.

May 24: The reddened patches on the upper lip have increased in dimensions and now present small areas of superficial necrosis. Otherwise mouth lesions are unchanged. Has taken no food in 48 hours. Weight is 11.4 kilograms. Temperature at 10.45 a. m., 39°.

May 25: The reddened patches on the upper lip have coalesced to form a continuous band on each side. There is some superficial necrosis within the area of the lesion on the left side of the upper lip. The mucosa of the cheeks, of the anterior faucial pillars and of the floor of the mouth is bright red. There is some superficial necrosis of the mucosa of the cheeks. Temperature at 9.50 a. m., 38.5°.

Discontinues test diet and begins stock diet No. 156. (Table 4.)

May 28: Affected areas of mucosa of mouth less red; some necrotic patches still in evidence but apparently healing. Has eaten all food offered since the change in diet on May 25.

May 31: Except for a little residual reddening on lips and cheeks, the mouth is about normal in appearance. Continues to eat well. Weighs 12.4 kilograms. Further history not relevant.

Dog 93.—Male. Acquired November 5, 1925. Served in a previous experiment, but has never while under observation presented recognizable evidence of black tongue. On stock diet No. 156 (Table 4) from March 15 to April 6, 1927.

April 6, 1927: In good condition; weighs 14.1 kilograms. Begins test diet No. 288.

April 19: Has left some food three times since beginning this test; weighs 13.9 kilograms.

May 3: During past two weeks has left some food six times; weighs 13.1 kilograms.

May 17: Food consumption during the past two weeks has been much reduced; weighs 11.8 kilograms.

May 31: Food consumption has continued on a much reduced plane; weighs 11.3 kilograms.

June 7: Food consumption during the past week has been much improved; weighs 11.3 kilograms.

June 8: Has eaten all food offered daily during the past four days. This morning there is present a slight but suspicious injection of the musosa of the floor of the mouth.

June 9: Eating well. Floor of mouth is perhaps not so red as yesterday.

June 10: Eating well. Mouth appears normal.

June 14: Has been eating well during the past 10 days; weighs 11.9 kilograms.

June 28: Has continued to eat fairly well, although some food was left twice during the past two weeks; weighs 12.2 kilograms.

July 12: Has continued to gain in weight although there has been some decline in food consumption. Weighs 12.4 kilograms.

July 16: Floor of the mouth is slightly reddened.

July 17: Floor of the mouth is more definitely reddened. There is also some reddening of the anterior faucial pillars. Food consumption is considerably reduced.

July 18: In addition to the reddening of the floor of the mouth and of the fauces there is present an irregular, faintly red patch on each side of the upper lip opposite the canines.

July 19: There is present a faint but definitely reddened band on mucosa of the upper lip on each side. The appearance of the floor and the fauces is about as noted yesterday. There has been a doubt for several days as to the normality of the scrotum. This morning the caudal half is reddened, the erythema being particularly pronounced and sharply limited along the caudal limit of the affected area. Food consumption has become much reduced; weighs 12 kilograms.

July 20: Mouth lesions are about as they were yesterday. Central portion of the ventral aspect of the scrotum is desquamating while posteriorly the reddened area is less bright than it was yesterday. Ate nothing yesterday.

July 21: The bands on the upper lip have become brighter and the mucosa of the cheeks and anterior faucial pillars has become more red. Appearance of the floor of the mouth not notably altered. Scrotal erythema has about disappeared; desquamation continues. Not eating.

July 22: Presents a moderate spastic paraplegia this morning. Is found down in the kennel, but when raised is able to stand and walk with a stiff tiptoe sort of gait. After walking about a minute and after such handling as was needed for an examination of the mouth, etc., a convulsion developed. The convulsion was of a clonic type with marked retraction of the head. Following the convulsion, which may have lasted a minute, the animal seemed dazed and irritable. This condition rapidly subsided and the animal was able to walk back to his kennel. The convulsion was quite like that of polyneuritis. The mouth lesions seem much less red.

As a possible check on the nature of the spasticity and the convulsion, the dog is given 12 grams of an antineuritic preparation in capsules.

July 23: The spastic condition noted yesterday continues little if at all changed. On walking there is the same stiff tiptoe gait. In addition there appears to be some lameness present in the right front leg. No further convulsions have been observed or elicited.

The bands on the upper lip and the redness of the fauces are slightly more pronounced.

Again given 12 grams of the antineuritic preparation in capsules. Has refused all food during the past four days. Temperature at 9.30 a. m., 37.8°.

July 24: Found this morning drooling a bloody secretion. The affected portion of the upper lip and the buccal mucosa are covered with a thick gelatinous pseudomembrane. No evidence of spasticity or lameness. The antineuritic preparation is discontinued and a dose of a commercial dried aqueous extract of yeast (yeast vitamin powder, Harris) is administered. Has taken no food in five days. Temperature at 9.30 a. m., 38.8°.

July 25: At 9.30 a. m. found lying down, but is able to get up and seems to walk normally. Drooling of bloody saliva continues. Upper lip and cheeks are bright red with eroded, ulcerated areas but the pseudomembrane has largely cleared up. Given another dose of the yeast extract. Temperature, 36.5°—3 p. m.: Has had a copious thin brown bowel movement since this morning. Temperature, 36.6°.

July 26: Found dead this morning.

Necropsy.—Fur is soiled. Rigor mortis is marked. There is a considerable layer of subcutaneous fat.

The larynx, except for slight injection of the epiglottis, is normal. The trachea is normal.

Lungs and heart are apparently normal.

The mocosa of the upper lip is bluish-gray in color and is eroded slightly. The tongue is dark but the mucosa is intact. The mucosa of the floor of the mouth is intact.

The esophagus is normal. The stomach contains a yellowish fluid; the mucosa is normal.

The upper half of the small intestine contains some yellowish fluid; the lower half is empty. The mucosa of the small gut appears normal.

The large intestine contains a semiliquid grayish brown material. The mucosa is apparently normal. The rectum is normal.

The urinary bladder is distended; the mucosa is normal.

The spleen, liver, pancreas, and kidneys are apparently normal.

Dog 97.—Male. Acquired January 18, 1926, when about 9 weeks old. Served in a previous experiment but has presented no recognizable evidence of black tongue. On stock diet No. 156 (Table 4) from March 15, 1927, to April 6, 1927.

April 6, 1927: In good condition; weighs 10.4 kilograms. Begins test diet No. 288.

April 19: Food consumption has been uniformly excellent; weighs 10.4 kilograms.

May 3: Has continued to eat well; weighs 10.2 kilograms.

May 5: A small patch of injection is present at about the center of the floor of the mouth.

May 7: The floor of the mouth shows slightly increased injection, particularly about its center.

May 8: The floor of the mouth appears about as it did yesterday. On the mucosa of the left side of the upper lip opposite the canines there is a well-marked, reddened, roughly circular patch about 1 centimeter in diameter; at the corresponding site on the right side there is a similar but faint patch.

May 9: Each side of the upper lip now presents a reddened patch opposite the canines. On the left side there is an additional patch anterior to the canines. The floor of the mouth continues injected. Food consumption has continued excellent.

May 10: On each side of the upper lip there is now present a large reddened patch opposite the canines. Anterior to this there is a similar but smaller patch and posterior thereto there is a reddened streak which merges in a reddening of the mucosa of the cheeks. The anterior faucial pillars as well as the floor of the mouth are injected. Buccal odor is slightly foul. Left some food yesterday, the first time since beginning the test diet. Weighs 10.2 kilograms. Temperature at 10.30 a. m., 39°.

May 11: The reddened patches on the lip have increased in size and are covered with a necrotic film. The mucosa of the cheeks is likewise covered with a necrotic film. The anterior faucial pillars are more markedly reddened. The foul buccal odor is more marked. Temperature at 10 a. m., 39.8°.

May 12: The mucosa of each side of the upper lip now presents a continuous reddened band extending from the cheeks forward. This band presents irregular patches of necrotic membrane. The mucosa of the cheeks, anterior faucial pillars, and the floor of the mouth is vividly red. The mucosa of both cheeks is covered with a gelatinous membrane and the floor of the mouth presents patches of a similar gelatinous film. There is some salivation and

foul odor continues. Passed a thin brownish stool this morning. Refused all food yesterday. Temperature at 10.30 a. m., 40.2°.

May 13: Salivation (drooling) and foul buccal odor more pronounced. Inflamed condition of mouth if anything is more severe. Demeanor is notably subdued. Has taken no food in past two days. Temperature at 10.40 a. m., 40.2°; at 3 p. m., 40.5°.

As the animal seems gravely ill and likely to die within the next 40 or 72 hours and as it is desired to show it at a clinic prepared for the meeting of the American Medical Association, on May 15, treatment is this day begun with an aqueous extract of autoclaved yeast by drench in the hope that life may be sufficiently prolonged.

May 14: The animal, normally very lively, is content to stay quiet in its kennel. The mouth lesions continue necrotic. Drooling continues. Has passed a copious thin brown stool. Given some of the aqueous extract of autoclaved yeast by drench and some by stomach tube. Temperature at 9.45 a. m., 39.9°; at 3 p. m, 40 6°.

May 15: Apathetic in demeanor. Outer surface of jaw soiled with buccal secretion. The mucosa of the mouth seems generally less red and more clean, the ulcerated patches on the upper lip standing out very conspicuously. Given about 200 cubic centimeters of the aqueous extract of autoclaved yeast by tube at 9 a. m. A second portion of 200 cubic centimeters given by tube at 10.30 a. m. was vomited, together with what may have been left in the stomach of the first portion. Temperature at 9.20 a. m., [illegible] 4°; at 3 p m, 39.4°.

May 16: The mucosa of the upper lip and cheeks is less red and cleaner, though showing the scattered superficial ulceration. Margins of the fore part of the tongue are reddened. The tongue as a whole seems shrunken. The mucosa of the floor of the mouth continues red. The anterior faucial pillars are red but less so than a day or two ago. There is some blood-stained saliva on the lips.

Given some aqueous extract of autoclaved yeast in divided does by drench; vomited a portion. Has taken no food in the past five days. Temperature at 9.30 a. m., 40.1°; at 2.20 p. m., 39.6°.

May 17: Found dead this morning

Necropsy.—There is a moderate layer of subcutaneous fat; about a normal amount of omental and of perirenal fat.

The dorsum of the tongue is of a dark-blue color. The margins of this organ, especially anteriorly, are ulcerated The mucosa of the upper lip is ulcerated as observed during life. The floor of the mouth, the cheeks, fauces, and pharynx are involved in the inflammatory process. The lingual aspect of the epiglottis is reddened.

The trachea appears normal. Both pleurae contain fluid with fresh adhesions on the right side. The right upper lobe of the lung presents three or four firm, dark nodules as of hemorrhagic thrombi. Heart and pericardium are normal.

The liver, pancreas, spleen, and kidneys are normal.

The upper part of the esophagus is injected. The pyloric portion of the gastric mucosa is injected.

A tapeworm and some hookworms are present in the middle portion of the small gut. The lower half of the small gut presents submucous injection and a reddish mucus secretion over the mucosa suggesting the oozing of blood into the lumen. The upper part of the large gut appears as does the lower half of the small intestine. The mucosa of the lower part of the large gut shows longitudinal folds seemingly with submucous hemorrhages.

Urinary bladder distended.

Considering the first appearance of the mouth lesions as marking the onset, we find that in from 30 to 117 days after beginning test diet No. 288 all five dogs developed a pathological condition which was indistinguishable from that shown by the dogs in experiment 1. Thus the result of experiment 2 was essentially identical with that of the experiment performed four years previously.

In experiments 1 and 2 the test diet used was, as already stated, designed as a somewhat simplified representation of a type of diet observed in association with the occurrence of pellagra (4). We have also tested, by feeding the dog, the diet, or rather a slightly simplified replica of the diet, used by Goldberger and Wheeler in the feeding experiment in white male convicts carried out in 1915 at the Rankin prison farm of the Mississippi Penitentiary, with which they succeeded in producing pellagra in 5 of 11 volunteer human subjects (5). That test is briefly detailed in experiment 3.

EXPERIMENT 3

The methods employed in the care, feeding, and observation of the test animals were the same as in experiment 1. The composition of the test diet, No. 117, is shown in Table 5. Six dogs, numbered 9, 33, 38, 42, 47, and 48, were used as the test animals. The effect of this feeding is shown in the following for each of the test animals:

Dog 9.—Male. Acquired April 1, 1923. Suffered an attack of experimental black tongue beginning May 15, 1923. On stock diet No. 34C (Table 6) from May 28, 1923, to September 20, 1923. Weight September 18, 1923, 11.9 kilograms.

September 20, 1923: In good condition. Begins experimental diet No. 117.

September 23: Has eaten none of the test diet so far.

September 25: Ate nearly all the food offered day before yesterday; otherwise has eaten none of the test diet Weighs 11.5 kilograms.

September 29: Has eaten an increasing amount of the diet during the past three days.

October 1: Has eaten all the food offered during the past two days. The mucosa of the floor of the mouth is injected and there are patches of redness on the mucosa of both cheeks.

The development of these suspicious signs at the end of a period of 11 days during half of which none of the test diet was eaten suggests the desirability of reconditioning this dog and then repeating the experimental test. With a view, at the same time, of accustoming this animal to the test diet the reconditioning will be attempted by supplementing diet No. 117 with some ground fresh lean beef. Accordingly, 100 grams of lean beef are stirred into the day's allowance of the cooked diet.

October 2: Ate all food offered yesterday; weighs 11 kilograms. The mucosa of the floor of the mouth is quite red. The central portion of the mucosa of each cheek is diffusely reddened. A supplement of 100 grams of fresh lean beef is offered to-day. Temperature at 10 a. m. is 38.8°.

October 5: The mucosa of the mouth is distinctly less red than a day or two ago. Eating supplemented diet well.

October 6: The mucosa of the mouth is well-nigh normal in appearance. Has been eating well. Beginning to-day the allowance of fresh beef is reduced from 100 to 50 grams as a supplement to the daily allowance of 1,000 grams of cooked food into which it is stirred.

October 23: Has been eating well; weighs 12.6 kilograms.

November 6: Daily allowance of food was reduced by about 30 per cent beginning October 25. Has been eating well. Weighs 12.4 kilograms. Daily food allowance restored to previous level, beginning yesterday. Is in good condition.

November 27: Has been eating well. In excellent condition. Discontinues the beef supplement this day but continues diet No. 117, thus beginning a third feeding period. Weighs 12.7 kilograms.

December 4: Food consumption much reduced since discontinuing the beef supplement. Weighs 12.4 kilograms.

December 7: Food consumption during past three days has continued as a reduced rate. Mucosa of the floor of the mouth is suggestively injected.

December 8: No notable change in appearance of the mouth.

December 10: Injection of mucosa of the floor of the mouth is more definite and the mucosa of the cheeks is suspiciously flushed.

December 12: No notable change in the appearance of the mouth. Has taken no food during past two days.

December 14: Appearance of the mouth is unchanged. Ate a little food yesterday.

December 16: Mouth has returned to normal.

December 17: Floor of mouth is again injected.

December 18: Injection of floor of mouth is slightly more definite. Continues to take but small amounts of food. Weighs 11.5 kilograms.

December 19: Injection of the floor of the mouth is still more definite.

December 20: The injection of the floor of the mouth is now quite pronounced.

December 21: The floor of the mouth is intensely reddened; the mucosa of both cheeks and that of the left side of the upper lip are reddened. Food consumption continues small.

December 22: Small reddened patches are now present on the mucosa of the upper lip on each side. The mucosa of the floor and of the cheeks not notably changed in appearance.

December 24: The mouth lesions are more pronounced.

December 26: The mucosa of the floor of the mouth, of the soft palate, of the anterior faucial pillars and cheeks is decidedly reddened. The mucosa of the upper lip presents a bright red patch opposite the left canine and another, less red, on the opposite side. Has been eating considerably better during the past three days. Weighs 11.4 kilograms.

December 29: Mouth lesions are more pronounced. There is now present a well-defined red band along the labio-gingival fold of the upper lip on both sides. Continues to eat moderately well.

December 31: The appearance of the lip lesion is not notably changed; the injection of the other parts of the mouth is less intense.

January 2, 1924: Mouth presents no notable change. Food taking has continued at a moderate rate. Weight continues at 11.4 kilograms.

January 4: All mouth lesions have faded somewhat.

January 5: Mouth lesions seem to have paled further.

January 6: Condition of mouth seems unchanged.

January 7: Mouth lesions seem brighter, especially those on the lip and cheeks.

January 8: Reddening of the mucosa of the cheeks and soft palate has markedly

increased. Food consumption is variable, moderate to poor. Weighs 11 kilograms.

January 9: The mouth lesions are more pronounced this morning.

January 11: The lip lesion is less marked; the other mouth lesions appear unchanged. Begins a reconditioning diet, discontinuing diet No. 117.

January 12: Slight general fading of all mouth lesions. Ate all of the food offered yesterday.

January 13: Mouth lesions have faded further. Eating all food offered.

January 15: Mouth is practically normal in appearance. Further history not relevant.

Dog 33.—Male. Acquired August 6, 1923. Served in a previous experiment and had an attack of experimental black tongue beginning August 28, 1923. On stock diet No. 34C (Table 6) from August 28 to September 20, 1923. Weight on September 18 was 13.9 kilograms.

September 20, 1923: In good condition. Begins test diet No. 117.

September 25: Food consumption has fallen off rapidly and markedly since beginning the test diet. Weighs 13.5 kilograms.

October 1: Has eaten little or nothing during the past five days. Looks dejected. Sclerotics and conjunctivæ are slightly injected. Mucosa of the floor of the mouth is moderately injected. Buccal secretion is increased and quite ropy.

The development of buccal lesions at the end of 11 days, during about one-half of which, as in the case of dog No. 9, little or none of diet No. 117 was eaten suggests the desirability of immediate reconditioning. The reconditioning will be attempted by supplementing diet No. 117 with ground fresh lean beef. Accordingly, this dog is offered 100 grams of fresh beef this day apart from the cooked food.

October 2: Has had a very dark, soft bowel evacuation since last evening. Ate only about 25 grams of the fresh beef offered yesterday. This morning appetite seems to have returned, for he eagerly takes offerings of fresh beef; two offerings of 25 grams each were quickly bolted. Weighs 11.4 kilograms.

Came walking out of kennel on three feet, not using the left hind limb; after walking about a bit began to use this limb but evidently tried to favor it.

There is an eroded, bleeding area at the inner aspect of the right knee; at the outer aspect there are some irregular patches of superficial infection. The skin about the left knee is affected much as is that about the right knee. The skin of the inner aspect of the right thigh has long streaks of redness as if along lymphatics; that of the left thigh is patchily reddened. The skin about both elbows presents irregular erythematous patches and inflamed areas about sites of superficial injection.

The mucosa of the cheeks and of the anterior faucial pillars is moderately reddened. The floor of the mouth is markedly reddened The under surface of the tongue is affected but much less so than is the floor of the mouth.

October 3: Eating the beef but none of diet No. 117. Had two dark, semi-watery stools during the night. Appears fairly lively this morning. There is no lameness in walking, but there seems to be some stiffness in the hind limbs. The mucosa of the cheeks and floor of the mouth about as yesterday. In addition there has developed a small reddened patch on the mucosa of the upper lip in the region of the left canine teeth. The appearance of the skin of the knees, thighs, and elbows is much as it was yesterday.

October 4: Quite alert and lively this morning. Had a very small, dark, semi-liquid stool during the night. Condition of the mucosa of the mouth is about as it was yesterday. The erythematous patches noted yesterday as present at the elbows have nearly completely faded; the other skin lesions are not

appreciably altered. Continues to eat the fresh beef offered, but refuses the other food, diet No. 117. Has passed some dark, liquid stools during the day.

October 5: Is fairly lively. Some fresh beef was rubbed up with a portion of his cooked ration and offered yesterday afternoon. Has not eaten this. Seems to have an aversion to the cooked test diet. The floor of the mouth is less red. Diarrhea continues with dark, semi-solid stools. The condition of the skin about the knees has not undergone appreciable change, but that of the inner aspect of both thighs has improved very much.

October 6: The condition of the floor of the mouth is not appreciably changed, but there has developed in the course of the past 36 to 48 hours two distinct broad, bandlike patches, one on each side of the mucosa of the upper lip in the canine tooth region. Ate the supplement of 100 grams of fresh beef but not any of the cooked food. Temperature at 9.40 a. m., 38.9°.

October 7: The mucosa of the left cheek is quite definitely necrotic this morning; otherwise the mouth lesions are much as yesterday. Diarrhea continues. Ate the supplement of 150 grams of fresh beef yesterday. Temperature at 9 a. m., 39°.

October 8: The mouth leasions are distinctly improved. Diarrhea persists. Ate the 150 grams of fresh beef but none of the other food. Temperature at 9 a. m., 38.8°.

October 9: The mouth lesions are decidedly improved. Bowel evacuations are less fluid. Ate a fair amount of the cooked food during the past 24 hours for the first time in 12 days. The beef was stirred into the cooked food. Weighs 10.4 kilograms.

October 10: Mouth is well-nigh normal. Eating the cooked food with beef in it. Bowel evacuations are semisolid.

October 11: Bowel actions are now formed. The skin lesions are healing but the skin at the right knee appears freshly rubbed. Eating an increased allowance of food with beef stirred in. Beginning to-day there will be stirred into the daily allowance of 1,000 grams of the cooked food (diet No. 117) 50 grams of fresh lean beef.

October 14: Mouth seems about normal. The lesions of the skin about the knees and elbows appear to have been self-inflicted, due to scratching and biting. Continues to rub and scratch the knees and thighs, freshly irritated patches being present.

October 16: Food consumption is somewhat variable from day to day and still considerably below normal. Weighs 10.8 kilograms.

October 18: Found smeared with dark colored, pasty feces this morning. Skin of knees and elbows freshly gnawed and scratched. Seems weak and worn. Took no food yesterday. Had a convulsion during the morning and, judging by his appearance this morning, had a convulsion during the night. Given 50 grams of fresh beef apart from the cooked ration.

October 19: The condition of this dog is about the same as yesterday except that he appears somewhat livelier. Given 100 grams of fresh beef separately. Ate no food other than the meat yesterday.

October 20: Seems more lively this morning. Ate a good portion of the cooked food offered yesterday. Stirred into his food an extra 100 grams of fresh beef thus making 150 grams in all stirred in.

October 21: Patches on knees and elbows are freshly irritated. Eating better. Again an extra allowance of 100 grams of beef is stirred into the cooked ration.

October 22: The floor of the mouth is slightly injected; there is a faintly reddened patch on upper lip opposite the left upper canine. This condition of the mouth may be a residual one following the previously noted mouth lesions. Has eaten well during the past two days.

October 23: Injection of the floor of the mouth is more definite. There is a fairly definite reddening of the mucosa of the upper lip there being present an elongated patch extending forward from the region of the canines on each side. Shows a persistent twitching or jerky movement of the right front and the right hind leg, more pronounced in the latter, which causes him to lose his balance and stagger or fall toward the right. Eating well.

Suspecting that the daily allowance of beef the dog has thus far had is either inadequate or marginal it is this day increased by an extra 200 grams, thus making 250 grams in all, and it is stirred into the cooked ration. Weighs 10.9 kilograms.

October 24: Seems livelier this morning. Incoordination of movements of right fore and right hind leg is less marked. Skin lesions about knees and elbows appear to be healing. Has eaten all food offered during the past four days. A supplement of, in all, 250 grams of lean beef is again stirred into the daily allowance of 1,000 grams of the cooked food (diet No. 117).

October 25: Seems much improved in general condition. Shows some malfunction of right foreleg but this is less noticeable than yesterday. Mouth is about normal. Passed a dark colored, soft stool during the day. Eating all the beef-supplemented food.

October 27: General condition is further improved. Eating well. Fresh beef, 250 grams a day, is being included in the allowance of 1,000 grams of cooked food.

October 30: Has been eating well throughout the past 10 days. Has about returned to normal general condition. Weighs 11.7 kilograms. Passed two soft, dark colored stools to-day.

November 2: Shows new scratch marks and bites of the skin about knees and elbows. Passed a soft, dark stool. Has not been eating quite so well during the past three days.

November 5: Has eaten well during the past two days. Since this animal, though now in a much improved condition, has been slow in recovering it is thought desirable to try a little dry brewers' yeast in place of the 200 grams of extra beef with which the animal's diet has b n supplemented since October 23.

November 6: Continues to eat well; weighs 11.9 kilograms. Food allowance increased 50 per cent.

November 13: Has made marked improvement. The skin condition has healed. Has made a marked gain in weight. Weighs 13.5 kilograms.

November 27: Has been eating well and has been gaining in weight. Weighs 15 kilograms. Seems in good condition. Further history not relevant.

Dog 38.—Male. One of a litter whelped in the laboratory June 26, 1923. Served in previous tests and previously had black tongue, the latest beginning about December 24, 1923. On reconditioning diets from December 27, 1923, to January 29, 1924.

January 29, 1924: In good condition; weighs 8.2 kilograms. Begins test diet No. 117.

February 5: Food consumption has been excellent throughout the week since beginning this test. Weighs 8.7 kilograms.

February 12: During the past five days food consumption though good has been at a considerably reduced rate. Weighs 8.8 kilograms.

February 14: Presents this morning, 16 days after beginning the test diet, a blotchy reddening of the floor of the mouth.

February 17: The floor of the mouth is definitely injected. A small reddened patch has appeared on the mucosa of the upper lip opposite the left canine tooth. Food consumption at a reduced rate continued. This animal presents

definite signs of the beginning of our experimental pathological condition; test diet No. 117 is discontinued and reconditioning is this day begun.

February 18: Injection of the floor of the mouth has faded slightly.

February 22: Mouth lesions have about cleared up. Further history not relevant.

Dog 42.—Male. One of a litter whelped in the laboratory June 26, 1923. Served in previous tests and has had experimental black tongue, the latest attack beginning February 14, 1924. On a reconditioning diet from February 20 to March 1, 1924.

March 11, 1924: In good condition. Weighs 10.9 kilograms. Begins test diet No. 117.

March 18: Food consumption during the past week has been excellent. Weighs 11.3 kilograms.

March 25: Food consumption continues very good but during the past five days at a somewhat reduced rate. Weighs 11.6 kilograms.

April 1: Food consumption has continued at a reduced rate. Weighs 11.5 kilograms.

April 2: The mucosa of the upper lip on each side opposite the canines is slightly mottled red. The left border of the floor of the mouth shows patches of slight injection.

April 3: The reddening noted yesterday has well nigh completely faded.

April 4: Mouth seems normal this morning.

April 7: The floor of the mouth is intensely reddened as are also the mucosa of the cheeks and labio-gingival folds of upper lip on both sides.

April 8: If anything, the mouth lesions noted yesterday are more marked this morning. Food consumption has continued at a moderate rate. Temperature at 10 a. m., 39°. Weighs 11.5 kilograms.

April 10: Mouth lesions show no signs of improvement. Continues to eat moderately well.

April 11: A few irregular patches of superficial necrosis have appeared on floor of mouth and on the mucosa of the left cheek. Temperature 2 p. m., 38.7°. Test diet is discontinued, reconditioning is begun.

April 13: Mouth lesions are fading.

April 15: Mouth very greatly improved. Weighs 12 kilograms.

April 20: Mouth is again normal in appearance. Further history not relevant.

Dog 47.—Male. Acquired August 18, 1923 Served in a number of previous tests. Has already had experimental black tongue, the latest attack beginning January 7, 1924. On reconditioning diets from January 11 to March 11, 1924.

March 11, 1924: In good condition. Weighs 11.9 kilograms. Begins test diet No. 117.

June 23: This animal after a period of about 10 days of excellent food consumption, developed a capricious and slowly diminishing appetite. Has presented in other respects no evidence of any pathological condition during the 104 days since the beginning of the test.

The experiment is this day discontinued by reason of difficulty in the procurement of sweet potatoes of proper quality for the diet.

Dog 48.—Bitch. Acquired August 20, 1923. Served in some previous tests resulting in experimental black tongue. The latest attack began about November 5, 1923. Had an attack of an infective ulcerative stomatitis beginning December 17, 1923. On a reconditioning diet from December 20, 1923, to January 29, 1924.

January 29, 1924: In good condition. Weighs 6.7 kilograms. Begins test diet No. 117.

February 16, 1924: Presents an ulcerated or eroded-looking patch of the mucosa of the right cheek near the faucial pillar.

February 19: Has been eating fairly well though at a slightly reduced rate. Weighs 6.5 kilograms.

February 20: The ulceration of the mucosa of the right cheek has about healed.

February 22: Mouth is about normal.

March 25: Food consumption has been at a somewhat diminished rate. Weighs 6 kilograms.

March 27: A small pigmented and slightly reddened ulcerated patch has appeared on the mucosa of the upper lip opposite the right interdental space. There are also a few small slightly pigmented ulcerated patches along the central portion of the mucosa of the right cheek.

March 29: The lip lesion has become somewhat more pronounced and the patches on the mucosa of the cheek have coalesced into a dark brownish pigmented band, about 0.5 inch wide extending from the right faucial pillar forward. This seems to be the infective ulcerative stomatitis again.

March 31: Mouth shows no further notable change.

April 1: Food taking is rather variable. Weighs 6 kilograms.

April 2: A small pigmented ulcerated patch has appeared on the back part of the mucosa of the left cheek. The pigmented lesion on the right cheek and that on the upper lip not notably changed.

April 8: Mouth lesions appear cleaner with a noticeable tendency for the ulcerations to heal. Food taking variable and diminished. Weighs 5.6 kilograms.

April 10: The pigmented, ulcerated patches on the lip and cheeks have about healed.

April 22: There appears to be a renewal of ulceration over the previously pigmented patches on the mucosa of the cheeks. Food consumption has been somewhat further reduced. Weighs 5.3 kilograms.

April 23: The pigmented, ulcerated patches are more marked. There is a fetid buccal odor present. Has taken no food during past two days.

April 24: The floor of the mouth seems somewhat injected. No other notable change in mouth condition.

April 29: Eating poorly; becoming anaemic and emaciated. Weighs 5.2 kilograms.

April 30: Ulcers on cheeks have healed but there remains slight pigmentation of the posterior part of the mucosa of each cheek. Floor of mouth is negative.

May 20: Has been eating moderately well, maintaining her weight, which continues at 5.2 kilograms. The mucosa of the floor of the mouth is suspiciously blotchy red, 111 days since beginning the test.

May 21: The floor of the mouth, particularly about the root of the tongue is definitely reddened, confirming yesterday's suspicion. There are present also circumscribed erythematous patches on the mucosa of the upper lip of each side in the region of the canines.

May 22: Mouth is about as yesterday but with a new reddened circumscribed patch on the mucosa of the upper lip on left side near the angle of the mouth.

May 23: The reddened patches on the lip and the floor of the mouth have faded somewhat.

May 26: Only a residual indication of the reddened condition of the floor of the mouth is appreciable.

May 27: Mouth is about normal. Weight continues at 5.2 kilograms.

May 31: The floor of the mouth, particularly the left half, shows a streaky reddening.

June 2: Mouth again about normal.

June 10: Weight continues at 5.2 kilograms.
June 17: Weighs 5 kilograms.
June 18: The floor of the mouth and the mucosa of the cheeks and of the upper lip on both sides are suspiciously reddened.
June 19: Mouth condition is more pronounced.
June 20: The floor of the mouth, the mucosa of the cheeks, and of the upper lip are markedly injected. The reddened spots on the upper lip appear to be coalescing to form the bandlike lesion. The animal is quite emaciated and somewhat sluggish. Temperature at 9.45 a. m., 38.4°.
June 22: The reddened areas show a slight superficial necrosis especially noticeable on the floor of the mouth and posterior part of the cheeks.
June 23: The superficial necrosis of floor of the mouth and of the mucosa of the cheeks has extended with a separation of the necrotic film or membrane over parts of the affected area. There are a few necrotic patches over the reddened bandlike lesion of the upper lip. Temperature at 9.50 a. m., 38.7°.

Experiment is this day discontinued by reason of difficulties in procurement of sweet potatoes of the desired quality for the test diet. Reconditioning begins.
June 24: Eating has been very poor recently; ate almost nothing during the past four days. Weighs 4.9 kilograms.
July 3: Mouth lesions practically healed. Further history not relevant.

Within a period not to exceed 111 days, five of the six animals developed definitely recognizable evidence of a pathological condition indistinguishable from that shown by the test animals in experiments 1 and 2. The one animal (No. 47) which showed no recognizable evidence of the condition was fed the test diet during 104 days at the end of which period it was found necessary, by reason of difficulties in securing sweet potatoes of satisfactory quality, to discontinue the experiment. The possibility is therefore not excluded that this animal would also have developed the condition had the feeding been carried on for a longer period.

It may be here stated that, during the period of almost five years that the feeding study, of which the foregoing experiments form a part, has been in progress, we have induced with various modifications of the foregoing diets (8) the pathological condition detailed in the protocols above presented one or more times in each of a considerable number of dogs and have found that in all essentials, as we have learned to recognize them, the picture has always been the same. Therefore, for the sake of brevity in the presentation of the further results of that study, it will be helpful at this point to present a summary of our observations of this experimental condition.

THE EXPERIMENTAL DISEASE

After a variable period during which the animal's food consumption (appetite) may have been consistently good or may have varied irregularly, examination of the mouth reveals a more or less extensive patch, or patches, of reddening of the mucosa of the upper lip, or of the mucosa of the cheeks, or of that of the floor of the mouth, or of

all three with or without a flushing of the anterior faucial pillars and, at times, of the soft palate.

The initial reddening of the mouth is at times very fleeting. It may fade completely after a few hours or a few days, only to appear again after a variable interval. It may do this repeatedly, the attack taking on a seemingly intermittent or relapsing, and, in exceptional instances when thus sufficiently prolonged, a somewhat chronic, character.

The initial reddening of the mucosa of the upper lip varies considerably with respect to extent, site, and intensity. It may appear at first as a single patch on one or both sides, most commonly in the region of apposition to the canine teeth; or it may appear in the form of a horizontal row of two or more discrete, irregularly circular patches of various diameters, or finally it may appear as an elon ated red streak or band. As the attack progresses, the lip lesion, if it did not appear as such at first, develops on both sides into a sharply delimited, vividly red band. When fully developed, this band of variable and irregular width may extend on each side from the median line in front back to the cheek in the reddened mucosa of which it merges. The flushing of the mucosa of the cheeks and of the floor of the mouth may be streaky at first, but later becomes diffuse. The red of the lip lesion and of the floor of the mouth takes on a peculiar vermilion tint that is very striking and almost, if not quite, distinctive.

The tongue is ordinarily but slightly, if at all, affected until the attack is well advanced. There then develops a reddening of a segment of variable length of the lateral margin just back of the tip or at the indentations made by the canine teeth.

Sooner or later, frequently within 24 hours after the appearance of the lip lesion or of the reddening of the mucosa of the cheeks or of the floor of the mouth, irregular patches of superficial necrosis develop here and there within the reddened areas. These necrotic patches may appear of a brownish or grayish tint. At times there forms over the affected mucosa a grayish, jellylike film or pseudomembrane, which is readily removed by wiping with a bit of absorbent cotton. The necrotic process may also affect the mucosa of the base of the tongue, the soft palate, the fauces, and the gums. It frequently affects the lingual aspect of the epiglottis, but this is ordinarily not perceptible during life. At times the margin of the tongue, especially where indented by the canine teeth, becomes affected by a severe necrotic process and may take on a dark-blue tint. Exceptionally the entire free portion of the tongue takes on this color.

As the stomatitis progresses, a fetid odor and an increase in buccal secretion develop. With the advance of the stomatitis the odor

becomes more and more foul, frequently becoming extremely disgusting. The salivation may show itself at first only as a slight excess of moisture on the lips; later there is drooling, frequently of a stringy, egg-white sort of secretion, occasionally blood stained, which may hang from the corners of the mouth.

The appearance of the stomatitis is usually preceded by a falling off in (appetite) food taking. In exceptional instances, food taking may be excellent until after the development of the stomatitis has made considerable progress. In either event, as the attack proceeds, food consumption more or less rapidly declines and soon entirely ceases. If the attack is a rapidly progressive one, or as the advanced stage is reached, the animal does not again voluntarily take food, largely doubtless because of the inflamed condition of the mouth. At this stage the animal may perhaps thrust its muzzle into water as if it desired some but may make no effort to lap any of it.

In the terminal stages of the attack, vomiting or regurgitation, especially if forced feeding is attempted, may take place Hiccough has been observed. As the attack progresses the bowel evacuations generally become small and dry—constipated. Constipation may persist to the end Toward the end i some cases, however, this may be succeeded by diarrhea with small, brown, liquid and, at times, bloody evacuations

The temperature at first continues at or only slightly, if at all, above its normal level (38° to 39° C.); later the temperature rises and within 24 to 48 hours reaches a point somewhere between 40° and 41° Having risen, as a rule it remains up until the end approaches, when almost invariably it declines rapidly and almost always continuously to the end. In exceptional instances, a day or two after its first rise the temperature may drop (intermit) for some 24 hours, only to rise again to the same or higher level than that first attained. We have come to regard the rise in temperature as a sign of the gravest prognostic import. The chance of saving the life of the animal by therapeutic interference rapidly diminishes the longer treatment is delayed after the rise in temperature has taken place.

Aside from a variety of accidental skin conditions and in one case (dog 33, experiment 3) a self-inflicted dermatitis from biting and scratching, presumably because of itching or burning sensations, we have observed in some of the cases in males an eruption on the scrotum which appears to be a part of the picture we are considering. This eruption is a sharply marginated, desquamating, or exfoliating lesion involving a variable area of the ventral aspect of the scrotum. It may or may not be preceded by a recognizable erythema. Whether preceded by an erythema or not the desquamating area is frequently seen to present a narrow erythematous limiting zone or margin. In cases in which the beginning erythema occurs, the area of skin so

affected may be found, after a day or two, to have become glazed and at times pigmented a light brownish tint. This glazed, brownish epidermal layer seems to become thickened and sooner or later begins to desquamate or to exfoliate, leaving a smooth glistening new skin. At the periphery of the lesion there is left at first a ragged fringe which gradually clears up. Its evolution, margination, peripheral erythematous zone, and course distinguish it from other scrotal lesions that we have so far observed in the dog. It occurs in some 40 or 50 per cent of attacks in the male; we have not observed the eruption on the external genitalia of the female. In its mode of development and distinguishing characters (restricted localization aside) this dermatitis is frequently strikingly like, indeed can not be distinguished from, that which occurs in pellagra in man. This eruption may precede, coincide with, or follow, the development of the stomatitis.

The demeanor of the animal in the early stages presents little or nothing to suggest that it is sick. Toward the close, however, its liveliness diminishes notably and it becomes more and more apathetic. As the animal's food intake diminishes and ceases, its weight declines. If, as is usually the case, the course of the attack is acute or rapid and the animal dies within a week or 10 days there is, on inspection, no notable emaciation; if, as is much less common, the progress of the attack is of a prolonged, intermittent, or relapsing character, emaciation may become extreme.

Lachrymation with or without notable conjunctival injection has been observed in a few cases; a slight watery nasal discharge has occurred in still fewer instances. These may have been accidental manifestations—not properly a part of the experimental condition.

Convulsions of a clonic type have occurred in a few cases; see for example dog 5 in experiment 1 and dog 93 in experiment 2. Whether these are part of the disease proper or are due to a deficiency in antineuritic—as may in some if not all instances of convulsions in our experience have been the case—is not clear. In one of our cases a marked flaccid paraplegia and in another a slight weakness in the hind limbs was observed that could hardly have been due to antineuritic deprivation.

At necropsy one finds very little of significance in addition to the lesions of the mouth observable during life. These may present a somewhat different coloring post mortem, particularly if any considerable interval has elapsed between time of death and the examination. The reddening of the mouth lesions may be much less marked and these may be covered with a greenish gray instead of a grayish or brownish film or deposit. Frequently, too, one finds the margin or the whole free portion of the tongue of a dark-blue or black color when but little, if any, of this was present during life. There may

be some injection and at times some superficial necrosis of the mucosa of the lingual aspect of the epiglottis. Quite exceptionally the laryngeal mucosa may be injected. The mucosa of the upper part of the esophagus seems at times to be involved in the inflammatory process and thus may in some cases be found considerably injected. The stomach and intestines ordinarily present nothing notable. In some instances there may be in the course of the intestinal tract areas of congestion of the mucosa with here and there submucous hemorrhages and oozing of blood into the lumen of the gut. Occasionally the rectal mucosa is found deeply injected with some patches of superficial necrosis. Punctate subserous hemorrhages at times occur along the large and the lower part of the small intestine. Occasionally the vaginal mucosa may be injected. The other organs as a rule present to the eye nothing of note.

The scrotum, if affected during life, shows the scaling and margination of the dermal lesion; but the reddening, if any were present during life, may be but little appreciable.

Clinically, the distinctive early marks of the condition are the stomatitis, particularly the bilaterally symmetrical, sharply marginated erythematous bandlike lesion of the upper lip and the vivid red injection of the floor of the mouth. In some animals, when excited and panting, the buccal mucosa is likely to be generally flushed. This should, however, cause no difficulty or confusion nor should a peculiar infective ulcerative stomatitis occasionally encountered in dogs do so. This ulcerative stomatitis (see dog No. 48, experiment No. 3) is characterized by the occurrence on almost any part of the mucosa of the mouth of one or more variable-sized ulcers which are accompanied by a brownish pigmentation. These ulcers may have about the base a small reddened zone. This lesion which is primarily an ulcer with brown pigmentation of the mucosa differs markedly from the erythema with secondary superficial ulceration of the experimental condition. The peculiar dermatitis of the scrotum may appear considerably earlier than any recognizable lesion of the mouth, but if not fully marked may be difficult to distinguish from some of the other occasionally encountered accidental dermal lesions of the scrotum. We have, therefore, never used the scrotal eruption alone as a diagnostic criterion.

In our work we have commonly used our animals repeatedly so that many have had a number of more or less marked successive attacks. So far as we are able to judge, one attack confers no appreciable increase in resistance to another, nor does it appreciably diminish the resistance to a subsequent attack provided the animal is adequately reconditioned by proper feeding for a sufficiently long period during the interval. Susceptibility to attack appears not to

be influenced, at least not to any outstanding degree, by either age or sex.

The response to proper treatment when this is not too long deferred is commonly prompt and striking. The temperature, if it has already risen, declines to normal; the redness of the mouth rapidly subsides; the necrotic areas clean up, leaving healthy, superficial ulcerations which rapidly heal; the animal begins to eat, and within a week or 10 days little may be left of the grave pathological process that may have been present when treatment was begun.

Relation to black tongue of dogs.[4]—It has already been stated above that both our consultants and ourselves found the condition experimentally induced by us indistinguishable from the disease occurring spontaneously, known to American veterinarians as black tongue.[4]

Those unfamiliar with the spontaneous disease may find the following clinical description and the postmortem findings in two dogs, taken from a paper by Wheeler, Goldberger, and Blackstock (6), of interest for comparison with the above experimental condition:

> Onset is rather abrupt, with lassitude, loss of appetite, occasionally vomiting and thirst; the animal, though trying often, may be unable to take water. The mouth early gives off a characteristic offensive, nauseating odor and soon becomes sore. Salivation develops early, and the drooling saliva may become bloody.
>
> The buccal and lingual mucosa becomes more or less extensively injected and inflamed. In some cases the congestion becomes very marked, the mucosa then presenting more or less extensive purplish red areas. The tongue, more particularly the free anterior portion, may be thus affected; the margin may be bright red. Both tongue and cheeks may become covered with a dirty, gray, shiny coating suggestive of a diphtheritic membrane * * *.
>
> The mouth may present erosions and ulcers. Vomiting may occur and either constipation or diarrhea may be present; constipation is more often a symptom of the onset, diarrhea of the later stages. When there is diarrhea the stools may be bloody, particularly in cases with fatal termination. The temperature may at times be considerably elevated.
>
> The disease appears to end in death in about 75 per cent of the cases, running its course in these in some four to eight days.
>
> The American literature on the postmortem findings is extremely meager. The following notes are of two necropsies made * * * August 11, 1921. One (dog) had died 24 hours and the other 10 to 15 hours previously.
>
> In both animals the lingual and buccal mucosa was found markedly but unevenly congested, the congestion involving the mucosa of the lips and opposing gums. There was also some congestion of the mucosa of the larynx and epiglottis.
>
> The gastric mucosa showed a patch of moderate congestion in the region of the pylorus.
>
> In one of the dogs there was marked congestion of the mucosa of the large gut throughout its whole length, including the rectum; in the other no gross change in this part of the bowel was apparent.
>
> The contents of the gastro-intestinal tract was small in amount; in one it was seemingly of a mucus nature, in the other more watery. In both it was yellow-

[4] Synonyms: Stuttgart dog epizootic; typhus der Hunde (dog typhoid); typhus of dogs; gastroenteritis hemorrhagica; southern canine plague; sore mouth of dogs

tinged, probably from the medication administered just before death. This yellow tinting was also observed to affect the lingual mucosa and the buccal secretion.

Examination of the lungs, heart, liver, spleen, and kidneys disclosed no gross lesions.

Of interest in this connection, too, is the following from a case report by Goldberger, Tanner, and Saye (7):

On examining the sick animal (fifth day of sickness) we found that the conjunctivæ, especially the conjunctiva of the right eye, were much reddened, and there was some purulent secretion within the lower lid of the right eye. The owner stated that the eyes had been sore for about three weeks.

There was some drooling of ropy saliva. The lower jaw was soiled with this, and the forelegs where the jaw had rested on them were smeared with saliva and particles of garden earth.

The mucosa of the lips was found deeply inflamed with necrotic patches, especially on that of the upper lip at the site of contact with the canine teeth.

The jaws were closed and there was some resistance to our attempt to open them.

The buccal mucosa was found violently inflamed, and the tip and adjacent margins of the tongue were red. A very disagreeable odor was present.

Seen the next day the animal was

* * * unconscious and evidently dying. The condition of the mucosa of the lips and cheeks was as already noted. In addition it could be seen that the tongue presented a dark bluish patch on the left margin, one on the right margin, and a third on the under surface.

The floor of the mouth, which could not be inspected satisfactorily at our first visit, was now found to be severely inflamed. There was evidence that the animal had had a blood-streaked semiliquid bowel evacuation.

About three hours after death

* * * rigor mortis is quite well marked.

Conjunctiva of right eye is pale. The left eye shows more marked inflammation than during life. Yesterday the right eye was the more severely inflamed. Some purulent exudate in the conjunctivæ.

The mucosa of the upper lip and of the labio-gingival fold is severely inflamed, with irregular, superficial, necrotic-appearing patches. This inflammation extends down on the gums, and the affected area is limited by a rather sharp line of hyperemia slightly, but at a varying distance, above the gum margin, being farther removed at the canines than at the molars.

The mucosa of the lower lip is involved in a similar process. No hyperemic limiting line is appreciable, however, although the inflammation does not seem to extend quite to the gum edge.

The buccal mucosa presents an inflamed and superficial necrotic process quite like that of the lips. The mucosa of the soft palate presents a quite similar inflammatory and superficial necrotic process as that of the lips and cheeks.

The mucosa of the dorsum of the tongue is grayish white in appearance, except over about the anterior third, where it is reddened, the redness being uneven, patchy. The redness is particularly marked along the margins of the tip and anterior third of the tongue. On the right side the redness extends back for about two-thirds of the length of the tongue, involving more particularly the under aspect of this margin. On the inflamed reddened portion of the left margin of the tongue there are some indentations or erosions with a grayish surface. This

part of the margin presents two slightly separated segments, each about 3 or 4 millimeters in length, which are especially deeply inflamed and darkened in color. The right margin of the anterior portion of the tongue presents, like the left, a deeply inflamed hyperemic appearance, with a necrotic patch a little back of the tip.

The mucosa of the under surface of the tongue presents some superficial erosions or ulcers, three on the right side and two on the left. The eroded or ulcerated patches on the under surface of the tongue measure about ½ by 1 or 2½ centimeters. The mucosa of the floor of the mouth presents much the same inflamed appearance as does the buccal mucosa, except that the superficial necrotic process does not seem quite so severe. On each side of the frenum of the tongue there is a conspicuous oval fold of mucosa which is involved in the inflammatory necrotic process; each fold measures about ½ by 1½ centimeters.

The mucosa of the tonsils shows a marbled hyperemic appearance.

The mucosa of the pharyngeal aspect of the epiglottis is deeply congested. The mucosa of the fold extending from the base of the tongue to the epiglottis on the right side presents two superficial ulcerations. The mucosa of the epiglottis, tracheal as well as pharyngeal aspect, is deeply congested.

The trachea appears normal.

The middle lobe of right lung shows some irregular patches of consolidation and, possibly, edema. The left lung appears approximately normal.

Corresponding to the interventricular septum anteriorly there are a few punctate subpericardial hemorrhagic spots. The heart muscle and endocardium appear normal.

The liver appears normal. Adhesions (old) are present between the spleen and the omentum at the inner end of the spleen, at and near which there are present some extravasations along the line of some of the blood vessels of the omentum.

On the under surface of the omentum there are scattered dark points which, on close examination, appear to be minute varicosities of the minute omental vessels.

There is some adhesion of the capsule of the kidneys, a little of the cortex tearing away when the capsule is stripped.

The vaginal mucosa shows an inflammatory process with a superficial necrosis.

The esophagus presents irregular elongate patches of congestion, possibly representing effused blood. In the region of the pylorus of the stomach there is an area of reddened mucosa, within which area there are small patches of more intense congestion and perhaps effusion.

The duodenum presents three considerable patches of what seem to be submucous extravasations. Beside these there are other irregular smaller patches of practically the same character. In addition to the patches of seemingly submucous extravasation in the duodenum, several similar smaller patches are present scattered through the remainder of the small intestine, the jejunum and ileum.

In approximately the upper half of the large intestine the mucosa presents longitudinal reddened streaks, possibly representing submucous extravasations.

The mucosa of the lowermost portion of the rectum, close to the anus, shows marked congestion.

The stomach contained a yellowish flocculent fluid—probably food (milk and eggs). The large gut held a small amount of soft, deep brown fecal matter. One hookworm was found in the region of middle of the jejunum.

The resemblance of the spontaneous to the experimental condition is unmistakable. There are some differences, but with one exception they relate to minor details with respect to which the experimental

disease, as might be expected, affords more definite and fuller information.

The single important exception has to do with the presence of an eruption on the scrotum in some cases of the experimental disease. Such an eruption seems never to have been recorded as occurring in black tongue. Since the eruption by reason of its site may easily be overlooked, we are not inclined to attach any importance to this apparent difference between the two conditions. Indeed, we believe it highly probable that, if sought for, the scrotal dermatitis will be found to occur in the spontaneous disease much as we have observed it in the experimental condition.

Reference should here perhaps also be made to another point of apparent difference, namely, to the commonly held belief, at least up to a few years ago, that black tongue is due to an infection. This view seems to be based mainly on the occasional occurrence of the disease as an epizootic and, in a measure, on the observation that at times after the occurrence of one case in a kennel some, perhaps all, of the other dogs would also be affected. On the other hand, it has quite frequently been observed that the introduction of a case into a kennel is without result so far as the other dogs are concerned and, furthermore, experimental attempts at transmission from sick to well dogs have, with one or two doubtful exceptions, failed (6). The available evidence bearing on the etiology of the spontaneous disease is thus not inconsistent with the possibility of a dietary origin. In this connection we may state that the possibility that our experimental condition is due to an infection was given consideration early in our work, and at our invitation Dr. T. W. Kemmerer, at that time bacteriologist at the Hygienic Laboratory, now director of the State Hygienic Laboratory, Jackson, Miss., very kindly made a culture study (aerobic and anaerobic) of the heart's blood in four cases at necropsy. He reported to us that his results were negative. As our work has progressed and no evidence of communicability of the condition among our animals has at any time appeared and, still more, as we now induce the condition at will by feeding certain diets and can arrest its progress or prevent its occurrence by simple dietary means alone, the idea of an infection as the primary cause of the experimental disease can no longer, it seems to us, be seriously entertained. There being thus no clinical (including post-mortem) or etiological difference between the spontaneous and the experimental conditions to which significance can be attached, it seems permissible to conclude that they are identical.

Relation to the Chittenden-Underhill pellegralike condition in dogs.—As was mentioned in the introductory section of this report, Chittenden and Underhill (3) reported in August, 1917, on "the experimental production in dogs of a pathological condition which closely resembles

in its symptomatology pellagra in the human subject" by feeding a diet of boiled peas, cracker meal, and cottonseed oil. This report appears to be an elaboration of the observation mentioned by Chittenden in his book, The Nutrition of Man, which was quoted in the introductory section of the present communication. The condition produced in the dog by Chittenden and Underhill was described as follows:

> The onset of the pathological symptoms is generally very sudden. Usually the first abnormal manifestation is a refusal to eat, and examination will reveal nothing to account for the loss of appetite. The animal lies quietly in its pen and is apathetic. After continued refusal to eat for a day or two, the mouth of the dog will present a peculiar and characteristic appearance. The inner surface of the cheeks and lips and the edges of the tongue are so covered with pustules as to give the impression of a mass of rotten flesh. The odor from these tissues is foul and almost unbearable. When stroked with absorbent cotton the mucous lining of the mouth comes away in shreds. Intense salivation is present. The teeth appear to be solid and normal. A bloody diarrhea is present, attempts at defecation being very frequent and resulting in the passage of little more than a bloody fluid of foul odor. In some cases the thorax and upper part of the abdomen may contain many pustules half an inch in diameter which are filled with pus organisms. No other skin lesions are prominent. Death usually results without any particularly striking features.
>
> Certain dogs presented symptoms which were not common to all but undoubtedly bear a relationship to the usual manifestations. One animal apparently in the best of health was seized with a convulsion and died in a short time. Another developed the same type of convulsions but lingered for a period of a day, during which convulsions occurred at the rate of every five or six minutes. In the earlier part of this period the animal exhibited a blind, staggering gait, and would run her nose into a wall as though she could not see it. The left eye was closed and twitching, and the left legs were not under complete control, the toes being doubled up. The right side seemed normal. During the latter part of the day the dog lay in a state that appeared to be a mild, continuous spasm. A third dog showed a single convulsion as the initial symptom, and on the following day the characteristic foul mouth and bloody diarrhea were in evidence.
>
> At autopsy two types of conditions are recognizable. In the animals presenting foul mouth and bloody diarrhea the chief interest centers in the lower bowel and rectum which exhibit an intense hemorrhagic appearance. With those animals dying rapidly from convulsions the only visible abnormality of the alimentary tract is the presence in the duodenum of one or more large ulcers.

Allowing for the absence of detail in this description the resemblance to the condition experimentally induced by us and identified as black tongue can hardly fail to arrest attention. The only point of difference which may possibly be significant relates to the skin manifestations which Chittenden and Underhill describe as pustules and are thus quite unlike the pellagralike dermatitis of the scrotum observed in our animals. It is to be noted, however, that Chittenden and Underhill seem to have worked exclusively with females, on the external genitalia of which we have not observed the lesion which occurs on the scrotum of the male. This would explain the

apparent difference in the two conditions. We attach no significance to our failures, referred to in the introductory section, to reproduce the condition by feeding the Chittenden diets.

It is of interest here to note that the resemblance of the Chittenden-Underhill condition to black tongue of dogs was recognized by Carey, of Auburn, Ala., in 1920, and by Wheeler, Goldberger, and Blackstock in 1922 (6).

Considering at this time the similarity of the clinical manifestations alone, it would seem highly probable that the condition induced by us (black tongue) and that produced by Chittenden and Underhill are essentially identical.

RELATION OF EXPERIMENTAL BLACK TONGUE TO PELLAGRA

The resemblance of spontaneous black tongue to human pellagra seems to have attracted the attention of several observers (6). The first to note it appears to have been Spencer, a veterinarian of Concord, N. C., who, in 1916, stated that after studying these two maladies he was "forced to the conclusion that the so-called black tongue is canine pellagra." He gave, however, no details of his studies. Four years later Saunders, a physician of Waco, Tex., suggested that there might be some etiological connection between "sore mouth of dogs" and the human disease. In 1922, impressed by the clinical resemblance, Wheeler, Goldberger, and Blackstock (6) called attention among other things to the strikingly similar geographic distribution of the two conditions in the United States, pointing out that black tongue, like pellagra, seemed to occur principally in the Southern States.

As has already been remarked, the resemblance to pellegra of the experimental condition observed by Chittenden (1) arrested our attention over 12 years ago. This resemblance seems to have struck Chittenden and Underhill at about the same time as it did ourselves, for two years later—that is, in 1917—they published a more detailed account of Chittenden's study and specifically called attention to the resemblance of the condition in the dog to that in the human.

It must be recognized, however, that in all the foregoing the resemblance relates, in the main, simply to the occurrence in both conditions of a disturbance of the digestive tract, notably stomatitis and diarrhea. It seems to us, however, that the resemblance at all events between our experimental condition and pellagra is somewhat more detailed than this. In the first place certain of the characters of the stomatitis, namely the vivid red color, the superficial necrosis with, at times, the formation of a jellylike film or pseudomembrane, are striking features in common. A notable feature or accompaniment of the stomatitis in both conditions is salivation. The two conditions, particularly in the advanced stages,

have in common also a diarrhea which at times is bloody. A paradoxical feature of pellagra, frequently commented on, is the seemingly excellent general state of nutrition observed in many, sometimes even fatal, cases. This is quite characteristic of our experimental condition in the dog. The fever of so-called typhoid pellagra has its analogue, it would seem, in the temperature elevation in the advanced stage of black tongue. All this is striking and suggestive of the identity of the two conditions. More impressive, however, is the occurrence in experimental black tongue of an eruption that in its evolution and certain other distinctive clinical features is indistinguishable from the characteristic dermatitis of pellagra. Taken in conjunction with the other points of similarity to which reference has been made, we believe that the eruption constitutes well-nigh conclusive clinical evidence of the identity of the two conditions, black tongue and pellagra.

Important additional evidence of the identity of these two conditions is found in the suggestion of a common etiology indicated by the successful experimental production of the disease in the dog, as herein above shown, by feeding with a diet of a type found associated with the occurrence of pellagra and also with one previously actually found to be a pellagra-producing diet. Further evidence of a related character pointing to this identity, some of which has elsewhere been already briefly referred to by Goldberger, Wheeler, Lillie, and Rogers (8) will be presented in a later communication.

SUMMARY AND CONCLUSIONS

1. A pathological condition has been induced experimentally in the dog by feeding (*a*) a type of diet observed in association with pellagra and also (*b*) a diet previously found by experimental test in the human subject to be a pellagra-producing diet.

2. A description of the experimental disease summarizing observations extending over a period of nearly five years is presented.

3. The experimental condition is clinically and post mortem indistinguishable from the spontaneous disease of dogs known as black tongue or Stuttgart dog epizootic, and it is concluded that they are identical.

4. On the basis of the similarity of clinical manifestations it is considered highly probable that experimental black tongue and the Chittenden-Underhill pellagralike syndrome in dogs are identical.

5. An eruption restricted to the scrotum occurring in experimental black tongue, which in certain of its distinctive features is indistinguishable from the dermatitis of pellagra, is considered as constituting, at least in conjunction with the other points of resemblance, well-nigh conclusive *clinical* evidence of the identity of the two con-

ditions, black tongue and pellagra. Further evidence to the same effect is found in the suggestion of a common etiology indicated by the successful experimental production of the disease in the dog by feeding with pellagra-producing diets.

Acknowledgments

We desire to express our indebtedness to Surg. Edward Francis, of the United States Public Health Service, for permission to report the results of his feeding experiment in monkeys; to Surg. G. C. Lake, United States Public Health Service, for performing several of the dog necropsies herein recorded; to Drs. Leigh T. Giltner and Jacob E. Shillinger, of the United States Bureau of Animal Industry, and Dr. M. R. Blackstock, veterinarian of Spartanburg, S. C., for valuable aid, freely extended, in the diagnosis of the experimental condition, and to Dr. T. W. Kemmerer, formerly bacteriologist at the Hygienic Laboratory, for generously permitting us to repeat the results of his culture study of the blood of some of our early cases of experimental black tongue.

References

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TABLE 1.—*Approximate composition of diet No. 33*[1] *offered to dogs during a brief initial period of experiment 1. A slightly modified and somewhat simplified replica of a type of diet observed in association with pellagra*

(Total calories: 1,620)

Diet		Nutrients		
Articles of diet	Quantity	Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Cornmeal (white, commercial, unbolted)	200	15.0	8.4	131.8
Farina (Quaker brand)	57	6.3	.8	43.5
Rice (white)	28	2.2	.1	22.1
Cowpeas (California black-eyed)	14	3.0	.2	8.5
Lard	21		21.0	
Cod-liver oil	28		28.0	
Sodium chloride	10			
Calcium carbonate	3			
Gelatine	46	42.0		
Tomato juice (canned tomatoes)	115			
Total nutrients		68.5	58.5	205.9
Nutrients per 1,000 calories		42.3	36.1	127.1

[1] The cornmeal, farina, rice, cowpeas (previously coarsely ground), lard, and sodium chloride were stirred into a suitable amount of tap water and then cooked in a double boiler of enamel ware for about an hour and a half. At the end of this period the cooking was discontinued and the remaining ingredients were well stirred in and the final weight of the mixture was brought to 2,000 grams by the addition of tap water with thorough stirring. 1 gram of the cooked ration represented approximately 0.8 calorie.

TABLE 2.—*Approximate composition of diet No. 34*[1] *offered to dogs in experiment 1*

(Total calories: 1,620)

Diet		Nutrients		
Articles of diet	Quantity	Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Cornmeal (white commercial, unbolted)	200	15.0	8.4	131.8
Farina (Quaker brand)	57	6.3	.8	43.5
Rice (white)	28	2.2	.1	2.1
Cowpeas (California black-eyed)	14	3.0	.2	8.5
Lard	21		21.0	
Cod-liver oil	9.5		9.5	
Cottonseed oil	18.5		18.5	
Calcium carbonate	3.0			
Sodium chloride	10.0			
Gelatine	46.0	42.0		
Tomato juice (canned tomatoes)	115.0			
Total nutrients		68.5	58.5	205.9
Nutrients per 1,000 calories		42.8	36.1	127.1

[1] The cornmeal, farina, rice, cowpeas (previously coarsely ground), lard, and sodium chloride were stirred into a suitable amount of tap water and then cooked in a double boiler of enamel ware for about an hour and a half. At the end of this period the cooking was discontinued and the remaining ingredients were well stirred in and the final weight of the mixture was brought to 2,000 grams by the addition of tap water with thorough stirring. 1 gram of the cooked ration represented approximately 0.8 calorie.

TABLE 3.—*Approximate composition of diet No. 288*[1] *offered to dogs in experiment 2. Essentially identical with diet No. 34 (Table 2) of experiment 1. (See text.)*

(Total calories: 2,400)

Diet		Nutrients		
Articles of diet	Quantity	Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal (white, laboratory sifted)[2]	300	25.2	14.1	222.0
Farina (Quaker brand)	90	9.9	1.3	68.7
Rice (white)	40	3.2	.1	31.6
Cowpeas (California black-eyed)	20	4.3	.3	12.2
Lard	23		23.0	
Cod-liver oil	14		14.0	
Cottonseed oil	20		20.0	
Calcium carbonate	4			
Sodium chloride	14			
Gelatine	66	60.3		
Tomato juice (canned tomatoes)	166			
Total nutrients		102.9	72.8	334.5
Nutrients per 1,000 calories		42.8	30.3	139.3

[1] The corn meal, farina, rice, cowpeas (previously coarsely ground) and lard were stirred into a suitable amount of tap water and then cooked in a double boiler of enamel ware for 1½ to 2 hours. At the end of this period the cooking was discontinued and the remaining ingredients were well stirred in and the final weight of the mixture was brought to 2,400 grams by the addition of tap water with thorough stirring. 1 gram of cooked ration represented approximately 1 calorie.

[2] Ground in the laboratory and sifted as in domestic practice, thus removing a small amount of bran.

TABLE 4.—*Approximate composition of diet No. 156.*[1] *Used as a stock or reconditioning diet for dogs*[2]

(Total calories: 2,400)

Diet		Nutrients		
Articles of diet	Quantity	Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Wheat (commercial Graham flour)	380	47.1	8.0	279.0
Fresh beef (lean, chopped)	350	79.4	8.8	
Whole dry milk (Merrell-Soule)	60	15.5	17.5	22.5
Butterfat	21		21.0	
Cod-liver oil	9		9.0	
Brewers' yeast, dry[3]	15	6.5	.1	6.7
Sodium chloride	6			
Calcium carbonate	9			
Bone meal[4]	6			
Total nutrients		148.5	64.4	308.2
Nutrients per 1,000 calories		61.9	26.8	128.4

[1] The Graham flour, sodium chloride, and bone meal are stirred into a suitable quantity of tap water and cooked in a double boiler of enamel ware for about 1½ hours. At the end of this period the cooking [illegible] brought to 2,400

[illegible] laboratory Nov. 4, 1923. On Mar. 9, 1924, at age of 4 months, began diet No. 156. Nov. 11, 1924, bred to dog 67 who was whelped in the laboratory Nov. 25, 1923, and had been on diet No. 156 since Mar. 19, 1924. On Jan. 12, 1925, bitch 59 whelped a litter of 6 pups, 2 of which were still-born and 2 of the others died within 24 hours. The remaining 2 were successfully nursed and weaned in good condition. On Oct. 1, 1925, bitch 59 again bred to dog 67 both having been continued on diet No. 156. On Dec. 9, 1925, bitch 59 whelped a litter of 7 healthy pups which were successfully nursed and all weaned in good condition.

[3] Rich in so-called vitamin B.

[4] Commercial bone meal (chicken feed) washed in repeated quick changes of hot tap water, dried in a current of hot air, then ground to a powder to pass a 60-mesh sieve.

TABLE 5.—*Approximate composition of diet No. 117 offered to dogs in experiment 3. A somewhat simplified replica of the Rankin Prison Farm experimental diet* [1] *(5).*

(Total calories: 3,036)

Diet		Nutrients		
Articles of diet	Quantity	Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal (white, commercial, unbolted)	242	18.2	10.2	159.5
Cornstarch	14			12.6
Farina (Quaker brand)	152	16.7	2.1	115.9
Rice (white)	31	2.5	.1	24.5
Cane sugar	90			90.0
Sweet potatoes (edible portion)	142	2.6	1.0	38.9
Cabbage (edible portion)	57	.9	.2	3.2
Lard	108		108.0	
Sodium chloride	10			
Total nutrients		40.9	121.6	444.6
Nutrients per 1,000 calories		13.5	40.0	146.2

[1] Computed to represent the average daily consumption per convict volunteer for the two-week period represented by the week ended Aug. 9 and that ended Aug. 29, 1915, as given in Hygienic Laboratory Bull. No. 120, p. 27.

The grits of the prison experiment diet were here replaced by an equal weight of commercial, unbolted corn meal; wheat farina was substituted for wheat flour, sugar for cane sirup, and cabbage for collards.

All of the components were stirred into water and cooked in a double boiler of enamel ware for 1½ to 2 hours.

At the end of this period the cooking was discontinued and the final weight brought to 2,500 grams by the addition of tap water with thorough stirring. Each gram of cooked ration represented approximately 1.2 calories.

TABLE 6.—*Approximate composition of diet No. 34C* [1]. *Used in the earlier period of the study in dogs as a stock or reconditioning diet* [2] *later replaced by diet No. 156. (Table 4)*

(Total calories: 1,946)

Diet		Nutrients		
Articles of diet	Quantity	Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Cornmeal (white, commercial, unbolted)	200	15.0	8.4	131.8
Farina (Quaker brand)	57	6.3	.8	43.5
Rice (white)	28	2.2	.1	22.1
Cowpeas (California black-eyed)	14	3.0	.2	8.5
Lard	21		21.0	
Cod-liver oil	9.5		9.5	
Cottonseed oil	18.5		18.5	
Sodium chloride	10			
Skim milk powder (Merrell-Soule)	105	36.6	1.4	54.0
Lean beef	100	23.2	2.5	
Tomato juice	115			
Total nutrients		86.3	62.4	259.9
Nutrients per 1,000 calories		44.3	32.0	133.3

[1] The corn meal, farina, rice, cowpeas (previously coarsely ground), sodium chloride, and lard were stirred into tap water and cooked in a double boiler of enamel ware for about 1½ hours. At the end of this period the cooking was discontinued, the remaining ingredients were well stirred in and the final weight was brought to 2,000 grams by the addition of tap water. 1 gram of the cooked ration represented approximately 1 calorie.

[2] Its adequacy is indicated by the following experience: Bitch 27 began diet No. 34C on May 17, 1923, early in gestation. On June 26, 1923, whelped a litter of 8 pups which were successfully nursed and weaned in good condition.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Purification of Swimming Baths Water—A Leeds Installation. Anon. *Surveyor,* vol. 72, No. 1865, October 21, 1927, p. 374. (Abstract by R. E. Tarbett.)

A brief article covering the purification plant for the two swimming baths at Holbeck. The combined capacity of the baths is 103,000 gallons The water is circulated through the purification plant once each six hours. It is taken from the deep end of the bath by an electrically driven pump and discharged to the chemical mixing and storage tanks, from which it passes through to 8-feet diameter "pulsometer" pressure filters operated by 172,000 gallons per square feet per hour. The water is heated and aerated before being returned to the pool, aeration being supplied by compressor.

The Water Purification Equipment of the Public Baths of St. Gall. W. Grimm. (Monats -Bull. schweiz. Ver. Gas.-Wasserfach. 1926, No. 5, 7 pp.) In *Chemical Abstracts,* vol. 21, No. 15, August 10, 1927, p. 2519. (Abstract by J. N. Wickert.)

"The pool has a surface of 200 sq. m., a water vol. of 300 cu. m., and accommodates about 61,000 people a year. 50,000 cu. m. a year of the standard drinking water supply is required. It is kept at a temperature of 23.5°. The water is withdrawn from the deep end, passed through a rapid sand filter, chlorinated, and returned to the shallow end. The added water enters with that which has just been chlorinated. The Cl content of the purified water is 0.5 to 0.9 g. per cu. m. The capacity of the filters is 4 times the volume of the tank."

State Regulation of Bathing Places. Arthur M. Crane *Journal American Association for Promotion of Hygiene and Public Baths,* vol. 9, 1927, pp. 30–33. (Abstract by J. L. Robertson.)

The writer notes in discussion of the American Public Health Association report of the joint committee on bathing places that it is quite within the province of duly constituted health authorities to specify a certain degree of purity of pool water and this to be enforced by the police power of the State, but the directions as to how these results may be obtained should not be in the form of an arbitrary rule or regulation subject to penalty. Further comment is made on certain items of the report.

Water Supply and Sewerage for New Australian Capital (**Canberra**). Anon. *Engineering News-Record,* vol. 99, No. 10, September 8, 1927, p. 386. (Abstract by C. G. Gillespie.)

Population is 5,000. Water supply is from Cotter River. Watershed, area 170 square miles, is free of contamination. Average runoff is 70 m. g. d. Water will be stored in a 380 m. g. reservoir, safe yield 7 m. g. d., 15 miles from the city. Raising the dam to 100 feet will increase storage to 1,400 m. g. Water flows by gravity to a motor-driven centrifugal pumping plant, pumping against 840-foot head to a series of three service reservoirs, capacity 1 to 3 m. g. each. Sewage works consist of settling tanks, filters, and activated sludge unit. Experience will determine which system is best for future. Effluent runs to Western Creek, which must be protected against pollution. Treatment works are three miles away on Western Creek.

Bio-aeration Method of Sewage Treatment. H. W. Streeter. *Water Works,* vol. 66, No. 7, July, 1927, pp. 294–295. (Abstract by R. C. Beckett.)

This describes the bio-aeration method of sewage treatment at Sheffield; population, 540,000. Dry weather flow is 18,000,000 gallons; wet weather flow, 65,000,000 gallons. Of the dry weather flow approximately one-third is industrial wastes, such as that from steel mills and breweries. The plant consists of a detritus tank with a capacity of one-thirty-second of the dry weather flow, bar screens with ¾-inch slots and preliminary sedimentation basins of 15,000,000

gallons capacity. Effluent is divided, 10,000,000 gallons to bio-aeration plant, remainder to contact filters. The former consists of eight tanks which connect to Dortmund tanks, thence to final effluent.

Aeration is provided by contact with air on surface by causing sewage to flow through a series of parallel channels each 6 feet wide and 4 feet deep at a velocity of 1½ feet per second, and agitating the surface layers by overhung paddle wheels extended across the width of the channels.

The effluent is colorless and odorless, having a high relative stability and a bacterial content of about 50,000 colonies per c. c. The power consumption is estimated from 30 to 35 h. p. per million gallons. Cost of operation, 2 pence 18 shillings per million gallons, d. w. f. Cost of construction from 25,000 pounds to 30,000 pounds per million gallons, d. w. f.

The disposal of sludge is yet unsolved.

The Treatment of Sewage by Activated Sludge. Anon. *Annales d'Hygiene Publique, Industrielle et Sociale*, vol. IV, No. 12, December, 1926, p. 732. (Abstract by R. C. Beckett.)

The author, after a survey of the literature, concludes that the activated sludge process is of bacterial origin. The quantity of activated sludge must be proportioned to the consumption of the organic matter of the liquid, to the nature of these, to aeration, to the condition of the sludge, and to temperature.

It is necessary to aerate sufficiently to maintain the best bacterial flora, and to proportion the aeration to the activity of the bacteria, to the quantity of organic material to be acted on, and to the quantity of sludge in order not to pass the moment when the sludge itself is altered and commences to putrefy. The sludge should be settled well and should retain but little of the suspended solids.

Court Ruling on Erection of City Sewage Disposal Plant. Anon. *Water Works*, vol. 66, No. 7, July, 1927, p. 265. (Abstract by R. C. Beckett.)

The Texas Court of Civil Appeals in the case of Boyd et al. *v.* City of San Antonio, Texas, decided against the issuance of an injunction which would have prevented construction of sewage disposal plant on a site 2½ miles from the city limits, holding that the convenience of the public outweighed the damage done to any one individual.

It further held that evidence was insufficient to show that a nuisance would result; but if it did, the individual still had his remedy at law after the plant was in operation.

Separate Sludge Digestion. L. Siebert. Proceedings of the First Conference of Sewage Works Operators, Pennsylvania State College Bulletin No. 1, January, 1927, pp. 21–30. (Abstract by L. F. Warrick.)

The author presents an interesting historical outline of sewage treatment leading up to separate sludge digestion. This process provides for settlement of solids in one tank, with removal of scum and sludge therefrom at sufficiently frequent intervals to prevent the troublesome disturbances of septic action, to separate entirely sludge digestion tanks. Sewage settling tanks used are classed as (1) gravity, and (2) mechanical types. Most economical construction in the first case calls for a relatively small, square tank with a single hopper, the slope of which is 2 to 1, or about 63 degrees from the horizontal. The mechanical type of tank is that equipped with Dorr clarifier, link belt, or similar mechanism for positive removal of sludge. The design and operation of such equipment is briefly described.

Shortcomings of separate sludge digestion systems and some suggested remedies are summarized as follows: (1) Ineffective removal of settleable solids from septic action in settling tanks, due primarily to faulty design; (2) formation of scum

instead of sludge in the digestion tanks. Adjustment of pH to 7.3–7.6 with lime and de-watering the digestion tank are corrective measures; (3) lack of capacity for sludge digestion, which may be eliminated by de-watering facilities; (4) retarded or suspended sludge digestion, generally overcome by covering, and in some cases, by heating the tank; (5) cost of operation somewhat greater than Imhoff tanks.

Advantages are listed as follows: (1) Economy of construction cost as against the cost of Imhoff tanks, particularly where deep excavation is exceptionally expensive; (2) ability to accomplish efficient removal of settleable solids and production of a good sludge capable of easy drying; (3) flexibility in the relation of settling capacity to digestion capacity, since one may be increased without the necessity of increasing the other, which may be adequate; (4) more positive control over the operation and functioning of the separate units of the plant than in Imhoff tanks or other systems; (5) applicability of separate sludge digestion tanks as additions to Imhoff tank installations in which the sludge digestion capacity is insufficient but the settling capacity is adequate.

The Septic Tank—Its Function and Operation. Raymond O'Donnell. Proceedings of the First Conference of Sewage Works Operators, Pennsylvania State College Bulletin No. 1, January ,1927, pp. 7–9. (Abstract by L. F. Warrick.)

The author describes in a concise manner septic tank treatment of sewage under the headings of function, definitions, character of applied sewage, constructional features, operation, scum, and sludge. Removal of suspended matter by sedimentation and digestion of organic matter so removed constitute the functions of a septic tank. A successfully operating tank will probably remove 50 to 60 per cent of the settleable solids of separate sewage and reduce the volume of these by. gasification, liquefaction, and solidification to between 50 and 70 per cent of their original volume. Oversepticization is very detrimental to oxidation on filters or contact beds, while undersepticization produces excessive amounts of sludge. In cleaning a properly functioning tank, it is well to leave some sludge as seed for future operation. A vile, odoriferous sludge can generally be improved by removing a tank from service for six weeks, which in effect is separate sludge digestion.

New Water Softening Plant for Beverly Hills, California. R. L. Derby, *Western Construction News*, vol. 2, No. 20, October 25, 1927, pp. 31–34. (Abstract by E. A. Reinke.)

Beverly Hills derives its water supply from various wells averaging 15 or 16 grains per gallon hardness and 8 or 10 p. p. m. hydrogen sulphide. Treated water will not be over 3 grains hardness, and sulphides will be practically eliminated. After experimental work on a 70,000 g. p. d. plant a 5 m. g. d. plant was designed to include: (1) aeration; (2) coagulation with lime and alum; (3) sedimentation; (4) secondary alum coagulation; (5) secondary sedimentation; (6) filtration. Chlorination is provided to be added at any point after aeration. It will probably be used after secondary sedimentation. Aeration will remove 40 to 60 per cent of the hydrogen sulphide. The aeration house is covered and closed on the east and north, the southand west being open to take advantage of trade winds. In the northeast corner is a ventilating tower 118 feet high, with a 6-foot stack provided with an oil burner at the base. At the present plant no nuisance is noted with a 60-foot stack and none is expected in the new plant. Primary coagulation tanks with motor-driven mixing paddles are followed by a Dorr clarifier with 60-minute retention period. The water then flows through secondary coagulation tanks similar to the primary tanks and then to 2 sedimentation basins with 5 hours' retention period. Split alum dosage and long retention has been found economical and permits the greatest reduction of hydrogen sulphide. Five filter units of 1. m. g. d. each are provided, and the

design allows for five additional units on the opposite side of the pipe gallery. Red brass tube underdrains of the perforated pipe type are used and provision is made for air wash. The chlorinating apparatus is housed in a separate room with outside entrance. The clear water reservoir has a capacity of 5,000,000 gallons.

The Upper San Leandro Filtration Plant of the East Bay Water Company, Oakland, California. Wilfred F. Langelier. *Western Construction News*, vol. 2, No. 19, October 10, 1927, pp. 77–83. (Abstract by E. A. Reinke.)

The Upper San Leandro filtration plant is a thoroughly modern plant of 12 m. g. d. capacity, designed to handle the supply from Upper San Leandro Reservoir. In addition to high turbidity and color at certain seasons, traces of manganese were expected in the raw water, as had been found at the neighboring San Pablo plant, where it badly coated the sand grains and impaired the efficiency of filter units.

The plant consists of nozzle aerators; 4 coagulation units, each 20 feet in diameter by 20 feet deep, with motor operated stirring mechanisms; sedimentation basins of 2,000,000 gallons capacity arranged in duplicate for series or parallel flow and for double coagulation; four 3 m. g. d. filter units, bifurcated so that half units may be washed; chlorinators for treating raw and filtered waters; a 3,000,000 gallon filtered water storage reservoir; and provision for recovery of wash water.

Unusual features of the plant include, coarse Monterey beach sand (E. S. = 0.40 m. m.; U. C. = 1.7) to avoid manganese incrustation; use of red brass tubing for perforated pipe underdrains; use of air wash with high rate water wash to prevent incrustation of sand grains with manganese, simplified pipe gallery well lighted and drained and with all controls at a central table from which all four filters can be run by operator; chlorinators in rooms with outside entrances, but windows to allow operator to see these from inside, and use of one-ton cylinders of chlorine. The whole plant is designed and landscaped to give a pleasing appearance.

Milk-Borne Disease in Massachusetts. George H. Bigelow and Filip C. Forsbeck. *American Journal Public Health*, vol 17, No. 10, October, 1927, pp. 1019–1023. (Abstract by R. E. Irwin.)

"Questionnaires were sent to the 70 cities and towns of 10,000 population and over, and replies were received from 44. The population of the towns from which we received information is 70.2 per cent of the total population of the state."

In 11 tables the data for the past three years are tabulated with comparative figures from the previous reports, when these are available.

The information given in the tables as well as the summary and conclusions are worthy of careful study by those interested in statistics relating to milk-borne diseases, dairy inspections, and milk consumption. The authors emphasize the fact that "it should be stressed that the vulnerability of a milk supply is more accurately estimated by the number of outbreaks for which it is responsible than by the total number of cases."

Some Variations of the Heat Method for Sterilizing Milking Machines. L. H. Burgwald. *Journal Agriculture Research*, Washington, 1927, vol. 34, 27–33. Abstract by W. G. Savage in the *Bulletin of Hygiene*, vol. 2, No. 9, September, 1927, p. 730.

"Earlier workers found that heat sterilization methods gave excellent bacteriological results, but were destructive to certain of the rubber parts. The author carried out a further series of tests, judging the efficiency of the sterilization by the bacterial content of the milk obtained after the use of the milking machines. Very low counts were obtained when the units of the machine were heated in water at a temperature of 160° to 167° F. for 20 to 35 minutes, and then either

removed to a refrigerator or placed in a weak chlorine solution (about 1:20,000) between milkings. The life of the rubber parts was materially longer than when the units were allowed to remain in the hot water between milkings. A cold place (below 50° F.), if protected from contamination, gave nearly as good results as placing in a refrigerator. A lower temperature for the hot water, i. e., 145° to 150° F. gave longer life for the rubber parts, but the bacterial counts were not nearly as low as when the higher temperature was adopted. Any form of heat sterilization, however, shortened the life of the rubber parts more than salt or chlorine methods. The teatcup linings always perished first."

Various Antimalaria Organizations in Italy. B. Gosio., Provveditorato Generale Dello Stato Libreria, Rome. 1925. 180 pages. (Abstract by M. A. Barber.)

A description of malaria prevention activities now in operation in Italy. The scope of the work is indicated by the following topics:

Training school for malaria workers. A short and intensive course in the practical application of antimalaria measures is provided for those who are to give all or a part of their time to such work. The length of the course varies with the class of persons to be instructed: For physicians a few conferences and demonstrations may suffice; for less instructed persons, a period of 10 or 15 days.

Instruction of school children in malaria prevention. The work includes not only instruction in hygiene, but the practical application of hygienic measures—the establishment, in schools, of baths, heliotherapy, and other means for the cure of disease and preservation of health.

Ambulatory service, in which a personnel skilled in malaria work may move from place to place, instructing the people, curing the sick, and eliminating carriers. Sometimes units are provided only with a pack horse or horse and cart. A unit may be mobile, visiting sparsely populated districts or following migratory laborers; in localities more densely populated, units may remain for long periods of time. Diseases other than malaria may receive attention.

Colonies where malaria-infected children are assembled for treatment. Ordinary as well as hygienic instruction is provided for.

A warehouse where supplies of all sorts needed in malaria work are kept in stock.

Malaria research. In the chapters devoted to this topic Professor Gosio and Dr. A. Missiroli give many interesting details regarding malaria-control measures. They describe in full methods of studying the habits of the larvae and adults of mosquitoes and give a list of the aquatic plants which favor or discourage the development of larvae. No species of *Chara* was found which hinders the growth of anopheline larvae in that climate, at least during the season when they were studied. On the other hand, duckweed (*Lemna*), the action of which is only mechanical, asphyxiating larvae, has proved a useful measure in some localities, as in the valley of the Po. Among larvicides, Paris green has proved to be successful. Methods of drainage and types of drainage tile are described fully. *Gambusia*, introduced into Italy, has thrived there and become a useful ally in mosquito destruction. The apparatus and chemicals suited for killing mosquitoes in houses and stables are illustrated and described Domestic animals may prove useful in attracting Anopheles to stables where they may be captured or destroyed.

The book is well illustrated and not only describes the scope of antimalaria organizations in Italy, but also serves as a useful handbook for malaria workers.

Studies on Brazilian Mosquitoes. II. Chagasia fajardoi. Francis Metcalf Root. *American Journal of Hygiene*, vol. 7, No. 4, July, 1927, pp. 470–480. (Abstract by M. A. Barber.)

A description, fully illustrated, of the Brazilian anopheline, *Chagasia fajardoi*. The larvae of this species are found in rapid current streams, and, as in Oriental current breeders, their grappling tail hairs have more, stronger, and more decidedly hooked branches than do those of larvae which frequent quiet waters. The adult has a *Culex*-like resting attitude.

Malaria in Haiti. C. S. Butler and E. Peterson. *United States Naval Medical Bulletin*, vol. 25, No. 2, April, 1927, pp. 278–288. (Abstract by L. L. Williams, jr.)

This brief article is a very clear picture of the high points of malaria in Haiti, and a good description of the island in relation to mosquito production. Haiti has only one efficient vector of malaria, *A. albimanus*. This anopheline is capable of transmitting all three types of malaria. The authors give their reasons for believing that malaria was imported into Haiti and is not of native origin.

The island is small, having but 10,200 square miles, less in area than the State of Maryland; yet it has various kinds of climate—from tropical on the coast to temperate in the hills. The most important plateau is a large central plain, approximately 1,200 square miles in area. Parts of the island are desert-like in their dryness; other portions are exceptionally wet. Late summer and winter are the malarial seasons. *Albimanus* breeds in all sections of the island, wherever water collects and has been found up to 2,500 feet above sea level. Rainfall varies in different parts of the island from a minimum average of 21.7 inches annually (portion of the island where the runoff dries quickly, nonmalarious) to 167 inches in the most malarial part.

Malaria is very prevalent and severe. Splenic index in a large number of school children shows rates varying from a minimum of around 2 per cent to a maximum of 100 per cent. Many schools show rates between 20 per cent and 60 per cent.

The problem of control differs in type in the rural and urban centers. It is the authors' belief that rural districts must at present depend solely upon adequate quinine treatment of those sick. Many of the cities practice mosquito control, and it is advised that the remainder of them initiate its practice.

A. albimanus quickly commences breeding in new swampy places formed by heavy rains, thus differing from our *quadrimaculatus*. The malaria infection very closely follows the rainfall, lagging behind about two months.

Control work at Port au Prince is described in a general outline. It was an extensive piece of work. *Albimanus* was breeding in many of the street ditches in seepage areas, and the nearby extensive swamps. For the ditch breeding and the seepage, the attack was drainage and fill. Rock drains (earth covered) were used extensively with success. Much of the swamp land was dried by complete clearing of brush and opening it up to process of evaporation. Some of the swamps were drained, and low portions were filled. Apparently the major portion of the work has now been completed, but there is yet some which remains to do. The tables giving malaria infection by months for a number of years show a steady decline in the case rates from a January rate (1924) of 1,350 per thousand to the January rate (1926) of only 125 per thousand.

Oiling as a Remedy for Malaria. Anon. *All India Local and Municipal Self-Govt. Gazette*, vol. 14, No. 4, March 14, 1927, pp. 71–72. (Abstract by L. L. Williams, jr.)

This is a brief article in popular style designed for education of the citizenry on how to oil, where to oil, and when to oil. Warning is given against "submerged bundles" and "drip cans." The author says "Try it and see! It is a lazy way of doing antimalaria work; it is like wanting something for nothing."

Use of the spray can is described, and the care of the pump is stressed. Good outline is given on how to train Hindu workers as oilers. Use of a fine spray is stressed. The worker is compelled to walk in the ditch and is directed to walk rapidly while spraying.

DEATHS DURING WEEK ENDED JANUARY 14, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended January 14, 1928, and corresponding week of 1927. (From the Weekly Health Index, January 19, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Jan. 14, 1928	Corresponding week, 1927
Policies in force	69, 954, 836	66, 596, 510
Number of death claims	15, 439	13, 673
Death claims per 1,000 policies in force, annual rate	11. 5	10. 7

Deaths from all causes in certain large cities of the United States during the week ended January 14, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, January 19, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Jan. 14, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Jan. 14, 1928 [2]
	Total deaths	Death rate [1]		Week ended Jan. 14, 1928	Corresponding week 1927	
Total (69 cities)	8, 273	14. 2	12. 8	831	811	68
Akron	37			6	8	65
Albany [3]	40	17. 4	15. 3	4	3	82
Atlanta	94	19. 3	15. 7	15	14	
White	43		9. 5	9	5	
Colored	51	(4)	30. 3	6	9	
Baltimore [3]	269	16. 9	15. 7	29	24	64
White	209		13. 6	14	18	56
Colored	60	(4)	27. 7	6	6	94
Birmingham	77	18. 1	17. 5	5	8	48
White	33		15. 3	1	3	14
Colored	44	(4)	20. 9	4	5	90
Boston	250	16. 4	14. 7	19	21	53
Bridgeport	37			8	1	147
Buffalo	141	13. 3	15. 9	17	23	73
Cambridge	29	12. 1	10. 1	2	4	36
Camden	31	12. 0	11. 4	4	3	64
Canton	23	10. 3	13. 3	3	4	71
Chicago [3]	837	13. 9	12. 3	71	82	61
Cincinnati	155	19. 6	19. 4	15	8	91
Cleveland	197	10. 2	10. 9	21	25	57
Columbus	65	14. 9	16. 8	4	14	37
Dallas	75	18. 0	12. 8	6	7	
White	55		11. 9	4	6	
Colored	20	(4)	19. 0	2	1	
Dayton	40	11. 3	11. 5	5	4	83
Denver	96	17. 1	14. 2	18	7	
Des Moines	46	15. 8	10. 9	3	1	50
Detroit	285	10. 8	12. 1	35	72	54
Duluth	38	14. 8	15. 9	2	5	47
El Paso	29	12. 9	17. 0	4	5	
Erie	35			2	0	41
Fall River [3]	32	12. 5	11. 8	8	7	203
Flint	36	9. 1	7. 7	8	3	77
Fort Worth	44	13. 7	13. 1	8	5	
White	36		12. 7	6	5	
Colored	8	(4)	16. 0	2	0	
Grand Rapids	25	8. 0	12. 6	2	5	30
Houston	86			9	4	
White	57			9	2	
Colored	29	(4)		0	2	
Indianapolis	114	15. 6	13. 7	9	6	69
White	95		13. 3	8	4	70
Colored	19	(4)	16. 3	1	2	61
Jersey City	70	11. 3	12. 5	23	14	97
Kansas City, Kans	45	19. 9	14. 6	6	5	127
White	30		16. 2	5	3	[illegible]
Colored	15	(4)	7. 4	1	0	145
Kansas City, Mo	109	14. 6	15. 4	9	5	64

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended January 14, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, January 19, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Jan. 14, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Jan. 14, 1928 [2]
	Total deaths	Death rate [1]		Week ended Jan. 14, 1928	Corresponding week 1927	
Knoxville	43	21.3	11.2	6	0	130
White	41		11.6	6	0	145
Colored	2	(4)	8.5	0	0	0
Los Angeles	291			26	26	74
Lowell	21	10.0	15.6	4	5	84
Lynn	22	10.9	10.4	5	2	126
Memphis	87	25.1	21.6	3	11	35
White	46		19.9	2	10	37
Colored	41	(4)	24.7	1	1	31
Milwaukee	128	12.3	12.5	24	22	107
Minneapolis	115	12.2	10.0	11	9	66
Nashville	55	20.7	18.9	6	7	94
White	32		17.9	3	1	64
Colored	23	(4)	21.4	3	6	180
New Bedford	27	11.8	15.7	5	2	108
New Haven	50	13.9	12.1	4	1	56
New Orleans	169	20.6	18.9	11	16	53
White	124		14.8	8	8	58
Colored	45	(4)	30.7	3	8	44
New York	1,724	15.0	13.9	207	145	84
Bronx Borough	224	12.3	10.6	28	15	85
Brooklyn Borough	554	12.5	12.3	70	59	70
Manhattan Borough	741	22.1	19.1	87	54	103
Queens Borough	160	9.8	9.7	20	11	81
Richmond Borough	45	15.6	17.8	2	6	36
Newark, N. J	110	12.1	11.8	11	15	57
Oakland	70	13.4	14.0	2	8	22
Oklahoma City	49			5	4	
Omaha	60	14.1	11.7	3	7	35
Paterson	28	10.1	16.7	0	7	0
Philadelphia	534	13.5	14.7	48	42	65
Pittsburgh	204	15.9	18.5	21	29	69
Portland, Oreg	101			8	2	86
Providence	68	12.4	13.0	9	12	78
Richmond	52	14.0	14.4	11	4	144
White	32		13.4	5	3	101
Colored	20	(4)	16.9	6	1	220
Rochester	70	11.9	9.5	7	0	57
St. Louis	240	14.8	14.2	7	13	23
St. Paul	64	13.3	12.7	5	3	48
Salt Lake City [3]	30	11.4	13.1	3	5	49
San Antonio	82	19.7	18.3	9	7	
San Diego	31	13.5	22.2	1	1	19
San Francisco	154	13.8	15.3	10	6	63
Schenectady	26	14.6	9.5	4	1	125
Seattle	100	13.6	7.9	5	4	51
Somerville	24	12.2	13.9	3	2	104
Spokane	31	14.9	19.6	1	2	26
Springfield, Mass	44	15.4	12.7	5	2	79
Syracuse	45	11.8	14.0	3	4	36
Tacoma	22	10.4	13.6	4	3	102
Toledo	68	11.4	12.1	6	7	58
Trenton	37	13.9	14.1	4	1	68
Utica	34	17.1	17.1	4	4	90
Washington, D. C	162	15.3	15.9	12	13	68
White	97		13.4	6	8	50
Colored	65	(4)	23.4	6	5	111
Waterbury	22			1	1	29
Wilmington, Del	36	14.6	12.0	3	0	79
Worcester	48	12.7	13.1	4	6	49
Yonkers	28	12.1	5.3	5	2	114
Youngstown	33	9.9	8.0	8	7	107

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, Jan. 13, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 22, 1927, and January 21, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 22, 1927, and January 21, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928
New England States:								
Maine	3	2	40	2	157	54	0	0
New Hampshire								
Vermont					84	4	0	0
Massachusetts	99	103	17	10	158	1,466	0	3
Rhode Island	12	19		1	2	18	0	0
Connecticut	38	27	28	2	49	139	1	0
Middle Atlantic States:								
New York	327	447	[1] 143	[1] 24	794	991	0	2
New Jersey	119	171	44	16	67	265	2	1
Pennsylvania	229	286			812	796	1	2
East North Central States:								
Ohio		112		42		321		1
Indiana	54	40	89	48	156	55	0	0
Illinois	130	202	100	46	1,718	46	4	10
Michigan	98	98		12	149	438	0	1
Wisconsin	45	31	60	99	726	140	5	4
West North Central States:								
Minnesota	27	31	2	2	222	4	3	4
Iowa [2]	28		1		405		0	
Missouri	66	[4] 52	19	[4] 8	214	[4] 61	0	[4] 3
North Dakota	6	1	11		115	8	0	1
South Dakota	4			10	107	14	0	0
Nebraska	6	10			127	5	0	3
Kansas		22	8	4	285	26	2	1
South Atlantic States:								
Delaware	5	2	2	3		37	0	0
Maryland [2]	46	29	82	60	29	345	2	1
District of Columbia	13		1		4		0	
Virginia								
West Virginia	27	16	52	27	77	71	1	0
North Carolina	34	73			174	3,418	0	0
South Carolina	21	30	1,005	1,201	32	1,347	0	0
Georgia	40		173		72		2	
Florida	53	10	5	8	25	6	0	0

[1] New York City only. [2] Week ended Friday. [4] Exclusive of Kansas City.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 22, 1927, and January 21, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928
East South Central States:								
Kentucky		9		31		135		0
Tennessee	22	21	69	137	100	647	2	1
Alabama	26	38	100	351	60	210	1	2
Mississippi	20	6					1	
West South Central States:								
Arkansas	15	11	121	169	36	206	1	0
Louisiana	10	27	28	37	104	48	1	1
Oklahoma [3]	38	44	421	266	37	147	1	1
Texas	73	60	59	73	21	35	1	0
Mountain States:								
Montana	1	4			63	4	0	5
Idaho	6				69	2	0	3
Wyoming	5	1	1		177	3	1	2
Colorado	7	13		1	51	29	0	8
New Mexico	6	8	16		17	62	0	0
Arizona	5	3	14		35	19	0	1
Utah [1]	13	8	2	2	595	1	2	3
Nevada								
Pacific States:								
Washington	19	7			224	243	2	6
Oregon	14	19	43	35	34	34	2	1
California	181	132	39	41	1,687	70	2	4

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928
New England States:								
Maine	0	0	29	40	0	0	1	4
New Hampshire								
Vermont	0	0	12	7	0	0	0	0
Massachusetts	0	3	495	383	0	3	10	5
Rhode Island	1	0	15	49	0	0	0	0
Connecticut	0	1	111	149	0	20	2	2
Middle Atlantic States:								
New York	4	4	796	689	14	9	19	22
New Jersey	0	0	310	243	2	0	8	6
Pennsylvania	1	2	561	587	0	0	19	15
East North Central States:								
Ohio		4		313		17		12
Indiana	0	1	195	97	132	120	2	3
Illinois	0	2	397	416	43	27	14	19
Michigan	0	1	272	274	34	58	3	5
Wisconsin	0	1	198	208	0	29	6	1
West North Central States:								
Minnesota	1	0	269	150	2	2	5	4
Iowa [1]	1		71		11		0	
Missouri	1	[4] 1	170	[4] 69	17	[4] 51	2	[4] 2
North Dakota	1	0	57	37	3	5	2	1
South Dakota	0	0	99	63	4	10	2	1
Nebraska	0	0	54	79	18	37	1	1
Kansas	1	0	196	179	51	74	5	1
South Atlantic States:								
Delaware	0	0	37	8	0	0	0	0
Maryland [1]	0	0	81	80	0	0	6	7
District of Columbia	0		24		1		0	
Virginia								
West Virginia	0	2	58	67	10	20	29	6
North Carolina	0	0	75	80	37	175	6	2
South Carolina	2	6	15	25	10	15	4	0
Georgia	0		14		115		12	
Florida	1	0	37	9	34	7	6	5

[1] Week ended Friday. [3] Exclusive of Tulsa. [4] Exclusive of Kansas City.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 22, 1927, and January 21, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928	Week ended Jan. 22, 1927	Week ended Jan. 21, 1928
East South Central States:								
Kentucky		0		37		28		0
Tennessee	1	0	66	17	9	21	21	11
Alabama	1	1	39	22	27	8	5	7
Mississippi	0	0	20	16	13	15	1	1
West South Central States:								
Arkansas	0	0	6	9	7	14	8	3
Louisiana	0	0	19	13	15	20	7	9
Oklahoma [3]	1	0	48	37	24	142	6	18
Texas	0	0	43	56	43	23	6	4
Mountain States:								
Montana	0	1	107	39	3	32	1	1
Idaho	0	0	39	27	13	3	0	0
Wyoming	0	0	19	26	0	2	0	0
Colorado	0	0	70	127	29	23	1	2
New Mexico	0	0	28	23	0	1	2	2
Arizona	0	0	9	4	0	0	0	3
Utah [2]	0	0	29	9	5	17	0	0
Nevada								
Pacific States:								
Washington	1	2	97	64	33	51	8	6
Oregon	0	10	66	18	22	46	11	5
California	2	6	280	202	62	30	14	4

[2] Week ended Friday. [3] Exclusive of Tulsa.

Report for Week Ended January 14, 1928

DISTRICT OF COLUMBIA

	Cases		Cases
Diphtheria	32	Measles	7
Influenza	2	Scarlet fever	37

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November, 1927										
Kansas	2	154	15		216		12	447	139	19
December, 1927										
Georgia	1	107	524	105	224	17	1	97	24	52
Massachusetts	8	590	42	2	2,552		65	1,217	1	25
Nebraska	1	121	20		37		10	252	95	8
New Jersey	3	714	47		343		6	594	12	18
North Dakota	10	18			24		2	215	10	2
Vermont	0	9			18		0	46	0	0
Wisconsin	17	240	269		397		3	740	178	14
Wyoming	13	2			20		0	87	14	7

November, 1927

Kansas:	Cases
Chicken pox	702
German measles	4
Lethargic encephalitis	1
Mumps	61

Kansas—Continued.	
Paratyphoid fever	3
Pink eye	1
Septic sore throat	2
Vincents angina	3
Whooping cough	222

December, 1927

	Cases
Chicken pox:	
Georgia	115
Massachusetts	1,045
Nebraska	502
New Jersey	755
North Dakota	217
Vermont	325
Wisconsin	1,424
Wyoming	56
Conjunctivitis:	
Georgia	7
Massachusetts	24
Dengue:	
Georgia	2
Dysentery:	
Georgia	23
Massachusetts	1
German measles:	
Massachusetts	61
Nebraska	7
New Jersey	55
Wisconsin	38
Hookworm disease:	
Georgia	11
Lead poisoning:	
Massachusetts	5
New Jersey	1
Lethargic encephalitis:	
Georgia	1
Massachusetts	2
Nebraska	1
North Dakota	1
Wisconsin	1
Mumps:	
Georgia	41
Massachusetts	590
Nebraska	133

Mumps—Continued.	Cases
North Dakota	18
Vermont	76
Wisconsin	495
Wyoming	10
Ophthalmia neonatorum:	
Massachusetts	103
New Jersey	6
Paratyphoid fever:	
Georgia	3
Pink eye:	
Wyoming	1
Rabies in man:	
Georgia	2
Septic sore throat:	
Georgia	45
Massachusetts	9
Nebraska	6
Scabies:	
North Dakota	7
Tetanus:	
Georgia	2
Trachoma:	
Georgia	1
Massachusetts	1
New Jersey	1
Trichinosis:	
New Jersey	13
Typhus fever:	
Georgia	7
Whooping cough:	
Georgia	33
Massachusetts	755
Nebraska	22
New Jersey	667
North Dakota	24
Wisconsin	393
Wyoming	28

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 96 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,910,000. The estimated population of the 92 cities reporting deaths is more than 30,330,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended January 7, 1928, and January 8, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
42 States	2,084	2,302	
96 cities	1,008	1,151	1,137
Measles:			
40 States	7,362	9,195	
96 cities	3,077	2,242	
Poliomyelitis:			
42 States	60	20	
Scarlet fever:			
42 States	3,774	5,329	
96 cities	1,216	1,861	1,332
Smallpox:			
42 States	867	799	
96 cities	100	114	81
Typhoid fever:			
42 States	215	342	
96 cities	28	48	45
Deaths reported			
Influenza and pneumonia:			
92 cities	1,101	1,215	
Smallpox:			
92 cities	0	0	

City reports for week ended January 7, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence if epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	10	1	1	0	0	1	3	3
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	1	0	0
Manchester	84,000	0	2	0	0	1	0	2	1
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Burlington	[1] 24,089	2	1	2	0	0	0	1	1
Massachusetts:									
Boston	787,000	68	57	23	4	3	324	4	24
Fall River	131,000	1	5	2	1	1	0	0	1
Springfield	145,000	6	4	3	0	0	1	15	0
Worcester	193,000	17	6	4	0	0	2	77	2
Rhode Island:									
Pawtucket	71,000	4	1	2	0	0	1	0	3
Providence	275,000	0	10	12	0	2	7	5	7
Connecticut:									
Bridgeport	(2)	2	8	7	1	1	1	1	4
Hartford	164,000	9	8	10	0	0	1	0	1
New Haven	182,000	4	4	1	0	0	60	3	0
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	33	18	16	1	1	508	37	24
New York	5,924,000	144	209	275	33	9	93	23	230
Rochester	321,000	9	13	10	-------	1	7	1	8
Syracuse	185,000	28	6	3	-------	0	42	13	5
New Jersey:									
Camden	131,000	10	6	7	1	1	1	4	2
Newark	459,000	18	17	29	0	0	76	27	10
Trenton	134,000	0	5	0	0	0	2	0	3
Pennsylvania:									
Philadelphia	2,008,000	115	86	51	1	10	36	72	63
Pittsburgh	637,000	22	22	19	-------	5	192	55	33
Reading	114,000	11	5	4	-------	0	0	4	3
Scranton	143,000	18	-------	14	-------	-------	1	0	-------
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	31	13	17	0	1	146	0	15
Cleveland	960,000	51	38	52	3	0	14	108	19
Columbus	285,000	5	6	5	1	0	1	2	11
Toledo	295,000	53	12	9	0	0	85	12	10
Indiana:									
Fort Wayne	99,900	0	4	6	0	0	0	0	1
Indianapolis	367,000	18	12	7	0	1	13	47	19
South Bend	81,700	0	1	1	0	0	0	0	0
Terre Haute	71,900	0	1	0	0	0	0	0	0
Illinois:									
Chicago	3,048,000	95	102	107	14	4	21	23	96
Peoria	82,500	15	1	3	0	2	0	0	9
Springfield	64,700	4	1	3	1	1	0	10	2

[1] Estimated July 1, 1925. [2] No estimate made.

City reports for week ended January 7, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit	1,290,000	77	74	47	9	5	167	33	33
Flint	136,000	11	8	7	0	2	6	35	4
Grand Rapids	150,000	3	5	2	0	1	34	7	1
Wisconsin:									
Kenosha	52,700	13	2	2	0	0	0	4	0
Milwaukee	517,000	60	23	13	1	1	3	20	13
Racine	69,400	2	2	0	0	0	0	1	0
Superior	[1] 39,671	0	1	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	1	3	0	0	0	0	4	0
Minneapolis	434,000	42	22	15	0	2	2	7	11
St. Paul	248,000	14	17	1	0	0	4	24	13
Iowa:									
Davenport	[1] 52,469	1	0	3	0	-------	0	1	-------
Des Moines	146,000	3	4	1	0	-------	0	0	-------
Sioux City	78,000	-------	2	-------	-------	-------	-------	-------	-------
Waterloo	36,900	4	0	0	0	-------	0	0	-------
Missouri:									
Kansas City	375,000	30	10	2	1	0	4	65	15
St. Joseph	78,400	3	3	0	1	0	0	1	7
St. Louis	830,000	17	53	30	0	0	39	19	-------
North Dakota:									
Fargo	[1] 26,403	18	0	0	0	0	0	2	0
Grand Forks	[1] 14,811	0	1	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	[1] 15,036	3	0	0	0	-------	0	0	-------
Sioux Falls	[1] 30,127	0	1	0	0	-------	2	0	-------
Nebraska:									
Lincoln	62,000	26	2	3	0	0	0	18	0
Omaha	216,000	20	5	0	0	0	0	1	6
Kansas:									
Topeka	56,500	31	2	0	0	0	1	1	3
Wichita	92,500	2	4	1	0	0	0	0	6
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	0	3	3	0	0	0	4	4
Maryland:									
Baltimore	808,000	93	41	23	18	4	153	5	44
Cumberland	[1] 33,741	0	1	1	0	0	0	0	1
Frederick	[1] 12,035	1	0	1	0	0	0	0	0
District of Columbia:									
Washington	528,000	36	20	27	2	2	3	0	21
Virginia:									
Lynchburg	30,500	16	1	3	0	0	1	0	4
Norfolk	174,000	9	3	2	0	0	4	1	4
Richmond	189,000	4	8	7	0	1	28	1	5
Roanoke	61,900	2	2	2	0	0	1	0	5
West Virginia:									
Charleston	50,700	1	1	0	0	1	0	0	3
Wheeling	[1] 56,208	22	2	1	0	0	0	0	1
North Carolina:									
Raleigh	[1] 30,371	12	0	2	0	0	2	0	1
Wilmington	37,700	0	1	1	0	0	242	0	6
Winston-Salem	71,800	3	0	1	0	0	30	10	2
South Carolina:									
Charleston	74,100	0	1	0	61	1	0	0	6
Columbia	41,800	16	0	1	0	0	166	28	1
Greenville	[1] 27,311	0	0	2	0	0	90	0	3
Georgia:									
Atlanta	(2)	-------	4	-------	-------	-------	-------	-------	-------
Brunswick	[1] 16,809	0	0	0	0	0	1	2	0
Savannah	94,900	2	1	0	5	0	36	0	5
Florida:									
Miami	[1] 69,754	1	-------	4	0	0	0	0	2
St. Petersburg	[1] 26,847	-------	0	-------	-------	0	-------	-------	0
Tampa	102,000	5	1	3	0	2	2	0	4

[1] Estimated July 1, 1925.

[2] No estimate made.

City reports for week ended January 7, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST SOUTH CENTRAL									
Kentucky									
Covington	58,500	1	1	1	0	1	11	0	2
Lexington	47,500	2	--------	1	0	0	2	2	3
Louisville	311,000	2	7	3	8	0	12	5	10
Tennessee									
Memphis	177,000	6	6	9	0	1	281	8	9
Nashville	137,000	5	2	0	0	6	5	3	7
Alabama:									
Birmingham	211,000	19	4	3	15	6	4	2	17
Mobile	66,800	1	1	2	3	3	1	0	0
Montgomery	47,000	1	1	0	3	--------	0	0	--------
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	--------	1	--------	--------	--------	--------	--------	--------
Little Rock	75,900	1	1	2	0	0	35	0	1
Louisiana:									
New Orleans	419,000	0	13	11	12	14	0	0	21
Shreveport	59,500	6	2	2	0	1	9	0	4
Oklahoma:									
Oklahoma City	(2)	1	2	2	6	2	0	2	6
Tulsa	133,000	9	3	3	1	--------	1	10	--------
Texas:									
Dallas	203,000	18	10	15	0	3	0	0	6
Fort Worth	159,000	10	4	14	0	3	0	0	8
Galveston	49,100	0	1	0	0	0	0	0	1
Houston	[1] 164,954	6	6	19	0	1	0	0	7
San Antonio	205,000	1	2	11	1	1	4	0	18
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	1	0	0	0	0	0	0
Great Falls	[1] 29,883	0	1	0	0	0	0	0	2
Helena	[1] 12,037	4	0	0	0	0	0	0	0
Missoula	[1] 12,668	1	1	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	0	0	1	0	0	1	1	0
Colorado:									
Denver	285,000	40	10	5	--------	3	4	27	15
Pueblo	43,900	24	2	1	0	0	1	0	2
New Mexico:									
Albuquerque	[1] 21,000	7	0	0	0	0	48	1	1
Utah:									
Salt Lake City	133,000	10	3	1	0	3	1	0	3
Nevada:									
Reno	[1] 12,665	1	0	0	0	0	0	0	0
PACIFIC									M
Washington:									
Seattle	(2)	18	6	4	0	--------	125	16	--------
Spokane	109,000	10	3	0	0	--------	0	0	--------
Tacoma	106,000	6	4	0	0	0	2	3	2
Oregon:									
Portland	[1] 282,383	31	11	5	0	0	4	0	5
California:									
Los Angeles	(2)	66	45	28	21	6	10	16	43
Sacramento	73,400	3	3	1	0	0	3	1	1
San Francisco	567,000	50	19	15	2	1	10	2	6

[1] Estimated July 1, 1925. [2] No estimate made.

City reports for week ended January 7, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	1	0	0	0	0	0	0	0	1	21
New Hampshire:											
Concord	1	0	0	0	0	1	0	0	0	0	12
Manchester	2	0	0	0	0	0	0	0	0	0	15
Vermont:											
Barre	1	0	0	0	0	0	0	0	0	0	2
Burlington	1	0	0	0	0	1	0	0	0	0	9
Massachusetts:											
Boston	70	83		0	0	7	1	1	0	77	237
Fall River	3	13	0	0	0	2	0	1	0	2	31
Springfield	8	7	0	0	0	1	0	0	0	9	32
Worcester	13	5	0	0	0	3	0	0	1	9	63
Rhode Island:											
Pawtucket	1	5	0	0	0	0	0	0	0	4	-------
Providence	9	27	0	0	0	3	0	1	0	3	68
Connecticut:											
Bridgeport	10	1	0	0	0	4	0	0	0	3	37
Hartford	9	6	0	0	0	0	0	0	0	0	22
New Haven	9	0	0	0	0	1	0	0	0	12	45
MIDDLE ATLANTIC											
New York:											
Buffalo	24	41	0	0	0	3	1	1	0	20	163
New York	218	227	0	0	0	118	11	4	1	172	1,574
Rochester	15	3	0	0	0	1	0	0	0	0	90
Syracuse	13	14	0	0	0	1	0	0	0	21	52
New Jersey:											
Camden	6	1	0	0	0	1	0	0	0	1	25
Newark	26	13	0	0	0	6	0	1	0	58	119
Trenton	4	4	0	0	0	1	0	0	0	4	44
Pennsylvania.											
Philadelphia	93	66	0	0	0	30	4	0	0	51	551
Pittsburgh	39	20	0	0	0	6	1	0	0	13	192
Reading	2	13	0	0	0	0	0	0	0	2	25
Scranton	-------	5	-------	0	-------	-------	-------	0	-------	5	-------
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	19	19	0	0	0	6	1	0	0	0	128
Cleveland	43	25	1	0	0	13	2	1	0	41	154
Columbus	11	16	1	0	0	4	0	0	1	0	86
Toledo	16	11	1	0	0	7	0	1	0	4	76
Indiana:											
Fort Wayne	5	6	1	0	0	1	1	1	0	1	20
Indianapolis	10	5	10	6	0	1	0	0	0	2	110
South Bend	4	1	0	0	0	1	0	0	0	1	12
Terre Haute	3	0	1	3	0	1	0	0	0	0	19
Illinois:											
Chicago	133	93	1	0	0	45	4	0	0	107	810
Peoria	5	1	0	0	0	2	0	0	0	4	-------
Springfield	2	4	0	1	0	1	0	0	0	2	24
Michigan:											
Detroit	97	99	2	0	0	22	2	1	0	50	318
Flint	9	19	1	1	0	0	0	0	0	5	15
Grand Rapids	12	11	1	0	0	3	1	1	0	2	34
Wisconsin:											
Kenosha	2	2	1	0	0	0	0	0	0	2	2
Milwaukee	28	48	2	3	0	6	0	0	1	13	125
Racine	6	6	1	0	0	0	0	0	0	4	-------
Superior	3	3	1	0	0	0	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota:											
Duluth	9	4	0	0	0	1	0	0	0	0	13
Minneapolis	56	27	7	0	0	3	1	0	0	0	99
St. Paul	31	18	9	1	0	8	0	0	1	6	85

City reports for week ended January 7, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST NORTH CENTRAL - contd.											
Iowa:											
Davenport	2	2	1	1			0	0		0	
Des Moines	7	12	1	11			0	0		0	29
Sioux City	2		1				0				
Waterloo	2	1	1	0			0	0		0	
Missouri:											
Kansas City	14	16	2	4	0	5	0	0	0	7	84
St. Joseph	2	0	0	22	0	0	0	0	0	2	27
St. Louis	43	23	2	0	0	11	2	0	0	7	231
North Dakota:											
Fargo	2	2	1	0	0	0	0	0	0	2	3
Grand Forks	1	1	0	0			0	0		0	
South Dakota:											
Aberdeen	1	0	0	0			0	0		2	
Sioux Falls	2	1	1	0			0	0		0	6
Nebraska:											
Lincoln	2	1	0	2	0	0	0	0	0	3	17
Omaha	4	7	6	1	0	4	0	0	0	0	58
Kansas:											
Topeka	5	1	0	5	0	0	[illegible]	0	0	6	15
Wichita	3	5	0	20	0	0	0	0	0	1	23
SOUTH ATLANTIC											
Delaware:											
Wilmington	6	0	0	0	0	0	0	1	0	1	45
Maryland:											
Baltimore	33	29	0	0	0	16	2	2	1	14	253
Cumberland	1	0	0	0	0	0	0	0	0	0	11
Frederick	0	0	0	0	0	0	0	0	0	0	5
District of Columbia:											
Washington	23	29	0	0	0	10	2	0	0	10	148
Virginia:											
Lynchburg	1	1	0	0	0	1	0	0	0	3	15
Norfolk	2	4	0	0	0	1	0	0	0	2	
Richmond	5	1	0	0	0	3	0	0	1	0	55
Roanoke	2	1	0	0	0	1	0	0	0	0	18
West Virginia.											
Charleston	2	4	0	0	0	3	0	1	0	0	36
Wheeling	2	2	0	0	0	0	0	1	0	0	10
North Carolina.											
Raleigh	1	1	0	0	0	0	0	0	0	0	13
Wilmington	1	0	0	0	0	0	0	0	0	0	18
Winston-Salem	3	5	2	0	0	0	0	0	0	0	10
South Carolina.											
Charleston	0	0	0	0	0	2	0	0	1	0	33
Columbia	0	1	0	0	0	0	0	0	0	0	10
Greenville	0	0	0	0	0	1	0	0	0	0	10
Georgia:											
Atlanta	4		2				0				
Brunswick	0	0	0	0	0	0	0	0	0	0	4
Savannah	1	0	0	6	0	2	0	3	0	0	46
Florida:											
Miami		0		0	0	2		1	0	0	28
St. Petersburg	0		0		0	0	0		0		15
Tampa	1	1	0	0	0	0	0	0	0	0	31
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	1	0	0	0	1	0	0	0	0	14
Lexington		0		0	0	2		0	0	0	17
Louisville	6	29	1	0	0	6	1	0	0	6	98
Tennessee:											
Memphis	6	3	1	0	0	5	1	1	0	2	54
Nashville	2	0	0	0	0	7	1	1	0	0	53
Alabama:											
Birmingham	5	2	3	1	0	5	1	1	0	0	87
Mobile	0	0	1	0	0	3	0	1	1	0	33
Montgomery	0	3	0	0			0	0		2	

City reports for week ended January 7, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1		0				0				
Little Rock	2	1	0	0	0	0	0	0	0	0	
Louisiana:											
New Orleans	6	4	0	0	0	25	2	0	0	2	204
Shreveport	2	2	0	0	0	1	0	0	0	2	29
Oklahoma:											
Oklahoma City	3	3	1	18	0	1	0	2	0	0	34
Tulsa	2	3	0	0			0	0		4	
Texas:											
Dallas	4	7	1	1	0	2	0	0	0	3	57
Fort Worth	0	3	1	1	0	2	0	1	0	0	44
Galveston	0	0	0	0	0	1	0	0	0	0	20
Houston	2	8	2	0	0	3	0	0	0	0	53
San Antonio	1	3	0	3	0	9	0	0	0	0	90
MOUNTAIN											
Montana:											
Billings	1	1	0	0	0	0	0	0	0	0	6
Great Falls	2	2	1	0	0	0	0	0	0	0	8
Helena	1	5	0	1	0	0	0	0	0	0	3
Missoula	0	0	0	0	0	0	0	0	0	0	11
Idaho:											
Boise	2	0	0	0	0	0	0	0	0	0	11
Colorado:											
Denver	11	10	1	3	0	5	0	0	0	10	81
Pueblo	2	2	0	5	0	0	0	0	0	3	18
New Mexico:											
Albuquerque	1	6	0	0	0	9	0	0	0	0	23
Utah:											
Salt Lake City	3	2	1	3	0	3	0	1	0	0	34
Nevada:											
Reno	1	0	0	0	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	11	7	3	1			1	1		3	
Spokane	5	20	3	4			0	0		0	
Tacoma	3	1	4	0	0	1	0	0	0	0	26
Oregon:											
Portland	7	3	7	15	0	6	1	0	0	1	72
California:											
Los Angeles	26	21	5	0	0	14	2	1	0	14	313
Sacramento	2	4	1	2	0	0	0	0	0	0	15
San Francisco	14	19	1	3	0	9	1	0	0	3	195

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Vermont:									
Burlington	0	0	0	0	0	0	0	1	0
Massachusetts:									
Boston	1	1	0	0	0	0	0	0	0
Springfield	0	0	1	0	0	0	0	0	0
Rhode Island:									
Providence	0	0	0	1	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	4	3	0	3	0	0	0	4	2
Pennsylvania:									
Philadelphia	0	0	0	0	0	1	0	0	0

City reports for week ended January 7, 1928—**Continued**

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cleveland	0	0	1	0	0	0	0	0	0
Indiana:									
Indianapolis	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago [1]	7	1	0	0	0	0	0	0	0
Springfield	1	1	0	0	0	0	0	0	0
Michigan:									
Detroit	0	1	0	1	0	0	0	1	0
Wisconsin:									
Milwaukee	1	2	1	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
Iowa:									
Des Moines	1		0		0		0	0	
SOUTH ATLANTIC [1]									
Maryland:									
Baltimore	0	0	1	1	0	0	0	0	1
West Virginia:									
Charleston	0	0	0	0	0	0	0	1	0
South Carolina:									
Charleston	0	0	0	0	1	0	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Nashville	0	0	0	0	0	1	0	0	0
Alabama:									
Birmingham	0	1	0	0	1	1	0	0	0
Montgomery	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	1	0	0	0	0	0	0	0	0
Louisiana:									
New Orleans	0	0	1	1	0	0	0	0	0
Shreveport	1	1	0	0	0	0	0	0	0
Oklahoma:									
Oklahoma City	0	0	0	1	0	0	0	1	0
Texas:									
Dallas	1	1	0	0	0	0	0	1	0
Galveston	0	0	0	0	0	1	0	0	0
Houston	0	1	0	0	0	0	0	0	0
MOUNTAIN									
Montana:									
Great Falls	1	1	0	0	0	0	0	0	0
Colorado:									
Denver	1	0	0	0	0	0	0	1	0
Pueblo	1	1	0	0	0	0	0	0	0
Utah:									
Salt Lake City	1	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	2		0		0		0	0	
California:									
Los Angeles	1	0	0	0	0	0	0	1	0
Sacramento	1	0	0	0	0	0	0	2	0

[1] Rabies (human): 1 case and 1 death at Chicago, Ill., and 1 death at Richmond, Va.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended January 7, 1928, compared with those for a like period ended January 8, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, December 4, 1927, to January 7, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926–27 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928
101 cities	201	204	188	[2] 206	[3] 163	[2] 203	176	[4] 187	198	[5] 170
New England	163	216	160	200	160	193	158	165	158	149
Middle Atlantic	161	228	167	226	140	233	171	221	182	202
East North Central	223	228	213	248	[6] 182	212	193	200	223	176
West North Central	194	129	129	129	113	123	165	[7] 129	188	[8] 100
South Atlantic	237	190	216	140	[9] 214	143	173	129	222	[10] 154
East South Central	284	71	145	[2] 162	150	[2] 177	186	[2] 147	137	[2] 109
West South Central	266	218	258	218	168	344	223	[11] 271	252	[11] 246
Mountain	246	144	164	162	137	117	137	63	126	71
Pacific	238	168	252	168	225	157	155	141	230	123

MEASLES CASE RATES

	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928
101 cities	197	225	193	[2] 249	[3] 209	[2] 288	231	[4] 325	384	[5] 520
New England	165	539	229	604	167	536	184	708	253	917
Middle Atlantic	23	199	24	206	22	251	22	331	31	466
East North Central	212	140	256	117	[6] 249	157	294	160	427	265
West North Central	129	50	109	46	77	38	61	[7] 39	259	[8] 102
South Atlantic	54	527	89	607	[9] 62	797	179	832	204	[10] 1,461
East South Central	78	367	21	[2] 737	31	[2] 1,032	78	[2] 545	106	[2] 2,196
West South Central	146	134	82	252	103	84	13	[11] 110	186	[11] 197
Mountain	3,217	36	2,351	27	2,780	18	3,545	36	5,227	62
Pacific	613	178	603	238	879	257	697	283	1,517	383

SCARLET FEVER CASE RATES

	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928
101 cities	238	184	279	[2] 212	[3] 253	[2] 187	267	[4] 210	318	[5] 206
New England	340	320	387	325	248	281	356	346	491	340
Middle Atlantic	178	156	214	199	212	173	235	200	285	196
East North Central	235	216	241	243	[6] 255	212	245	257	288	234
West North Central	432	206	413	204	371	202	385	[7] 194	449	[8] 207
South Atlantic	173	134	199	163	[9] 171	145	238	149	231	[10] 152
East South Central	150	82	248	[2] 147	243	[2] 103	176	[2] 59	233	[2] 65
West South Central	142	117	236	172	125	92	150	[11] 129	153	[11] 103
Mountain	802	306	1,112	243	975	171	893	234	950	195
Pacific	230	152	383	154	303	191	252	126	340	184

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1926, 1927, and 1928, respectively.
[2] Louisville, Ky., not included.
[3] Terre Haute, Ind., and Norfolk, Va., not included.
[4] Sioux City, Iowa, Louisville, Ky., and Fort Smith, Ark., not included.
[5] Sioux City, Iowa, Fargo, N. Dak., Atlanta, Ga., Louisville, Ky., and Fort Smith, Ark., not included.
[6] Terre Haute, Ind., not included.
[7] Sioux City, Iowa, not included.
[8] Sioux City, Iowa, and Fargo, N. Dak., not included.
[9] Norfolk, Va., not included.
[10] Atlanta, Ga., not included.
[11] Fort Smith, Ark., not included.

Summary of weekly reports from cities, December 4, 1927, to January 7, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926–27—Continued

SMALLPOX CASE RATES

	Week ended—									
	Dec. 11, 1926	Dec. 10, 1927	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928
101 cities	11	13	16	[2] 19	[3] 14	[2] 16	14	[4] 15	22	[5] 17
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	1	0	1	0	0	0	1	0	0	0
East North Central	7	4	11	17	[6] 16	12	7	12	32	9
West North Central	38	75	46	115	28	77	40	[7] 82	57	[8] 108
South Atlantic	19	7	26	5	[9] 30	20	41	4	27	[10] 12
East South Central	21	5	78	[2] 7	36	[2] 29	47	[2] 15	41	[2] 7
West South Central	9	8	43	0	26	13	21	[11] 4	41	[11] 16
Mountain	18	99	0	117	18	90	9	144	0	106
Pacific	43	39	40	31	43	26	21	29	60	26

TYPHOID FEVER CASE RATES

101 cities	13	11	12	[2] 8	[3] 10	[2] 11	12	[4] 7	8	[5] 5
New England	2	12	31	0	40	9	24	14	9	7
Middle Atlantic	18	8	8	8	5	0	7	4	6	3
East North Central	3	9	5	3	[6] 3	8	5	5	5	3
West North Central	4	14	10	6	10	8	4	[7] 10	8	[8] 0
South Atlantic	24	9	19	9	[9] 16	16	34	13	7	[10] 15
East South Central	41	31	21	[2] 29	16	[2] 29	21	[2] 15	25	[2] 29
West South Central	13	21	21	17	17	17	17	[11] 13	25	[11] 0
Mountain	9	9	9	18	0	9	27	18	9	9
Pacific	16	13	24	16	21	10	16	0	8	5

INFLUENZA DEATH RATES

95 cities	17	12	14	[2] 14	[3] 15	[2] 17	17	[2] 19	20	[12] 19
New England	9	9	7	12	7	5	12	5	16	16
Middle Atlantic	12	7	13	9	14	11	21	14	18	13
East North Central	14	9	12	11	[6] 10	13	15	10	17	10
West North Central	15	6	15	6	11	10	8	8	14	[13] 4
South Atlantic	34	17	26	15	[9] 34	20	17	22	16	[10] 21
East South Central	41	56	5	[2] 88	36	[2] 59	26	[2] 81	48	[2] 132
West South Central	40	47	40	56	18	73	13	82	42	82
Mountain	36	9	9	9	27	27	46	72	63	53
Pacific	11	3	7	17	4	24	0	31	10	24

PNEUMONIA DEATH RATES

95 cities	129	110	137	[2] 118	[3] 137	[2] 135	164	[2] 157	195	[12] 170
New England	134	51	149	102	151	121	172	146	181	103
Middle Atlantic	140	119	147	117	166	127	180	158	208	186
East North Central	103	97	117	97	[6] 109	105	134	135	169	140
West North Central	118	100	120	91	91	98	118	108	116	[13] 126
South Atlantic	155	138	127	164	[9] 153	186	187	188	229	[10] 231
East South Central	171	148	120	[2] 162	109	[2] 243	191	[2] 221	213	[2] 273
West South Central	150	103	172	194	84	233	150	310	238	238
Mountain	109	216	273	135	164	243	201	198	368	195
Pacific	113	110	124	131	148	165	198	138	210	176

[2] Louisville, Ky., not included.
[3] Terre Haute, Ind., and Norfolk, Va., not included.
[4] Sioux City, Iowa, Louisville, Ky., and Fort Smith, Ark., not included.
[5] Sioux City, Iowa, Fargo, N. Dak., Atlanta, Ga., Louisville, Ky., and Fort Smith, Ark., not included.
[6] Terre Haute, Ind., not included.
[7] Sioux City, Iowa, not included.
[8] Sioux City, Iowa, and Fargo, N. Dak., not included.
[9] Norfolk, Va., not included.
[10] Atlanta, Ga., not included.
[11] Fort Smith, Ark., not included.
[12] Fargo, N. Dak., Atlanta, Ga., and Louisville, Ky., not included.
[13] Fargo, N. Dak., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

PLAGUE RATS ON VESSEL

Steamship "Modemi"—At Goteborg, Sweden—From Bahia and Buenos Aires—Under date of December 29, 1927, the arrival of the steamship *Modemi* from Bahia and Buenos Aires, with a cargo of grain, was reported at Goteborg, Sweden. Dead rats were found on board, but no plague was shown to exist at time of fumigation of the vessel. On December 22, 1927, plague indications were reported found among rats. The *Modemi* left Buenos Aires November 11 and St. Vincent, Cape Verde Islands, December 1, 1927.

ARGENTINA

Communicable diseases—November, 1927.—During the month of November, 1927, communicable diseases were reported at Rosario, Argentina, as follows:

Disease	Cases	Disease	Cases
Diphtheria	3	Scarlet fever	7
Gastroenteritis	33	Tuberculosis	17
Measles	2	Typhoid fever	2
Meningitis	21	Typhus fever	1
Plague	1		

Population, estimated, 419,487.

BARBADOS (BRITISH WEST INDIES)

Further[1] *relative to outbreak of malarial fever.*—Further information, under date of December 23, 1927, relative to the outbreak of malarial fever reported at Barbados, British West Indies, shows the disease prevalent in all parts of the island, with 930 reported cases. Of this number, 296 cases were stated to have occurred in the parish of St. James. To December 20, 21 deaths from the disease were reported. The fatalities were stated to have been among the aged.

BELGIAN CONGO

Yellow fever—Boma and Matadi—Kongo River ports—January 3, 1928.—Under date of January 3, 1928, seven cases of yellow fever were reported for the ports of Boma and Matadi, on the Kongo River, Belgian Kongo.

[1] Public Health Reports, Jan. 20, 1927, p. 152.

CANADA

Communicable diseases—Ontario—December, 1927—Comparative.—During the month of December, 1927, communicable diseases were reported in the Province of Ontario, Canada, as follows:

Disease	1927		1926	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis	2	1		3
Chancroid	1		1	
Chicken pox	1,306		1,247	
Diphtheria	449	18	317	
Dysentery		1		
Erysipelas	2			
German measles	16		19	
Goiter	8	3		
Gonorrhea	193		117	
Influenza	2	6		17
Measles	1,223		1,095	1
Mumps	2,166		147	
Pneumonia		126		165
Poliomyelitis	6		2	
Scarlet fever	493	1	534	5
Septic sore throat	3		3	1
Smallpox	381		106	
Syphilis	160	1	86	
Tuberculosis	169	65	118	50
Typhoid fever	73	5	42	6
Whooping cough	342	1	410	4

Smallpox.—Smallpox was reported present during the month of December, 1927, in 35 localities, the greatest number of cases according to locality being as follows: Ottawa, 122 cases; Toronto, 75; Kitchener, 31. At Egremont and East York, 18 cases, each, were reported; at Wilmot Township, 16 cases, Cornwall, and Rockland, each 13 cases. In 10 localities one case each was reported.

Communicable diseases—Ontario—Year 1927—Comparative.—During the years 1926 and 1927 communicable diseases were reported in the Province of Ontario, Canada, as follows:

Disease	Year 1927		Year 1926	
	Cases	Deaths	Cases	Deaths
Actinomycosis	3	2		
Cerebrospinal meningitis	39	25	37	23
Chancroid	36		11	
Chicken pox	8,041		7,787	
Conjunctivitis, acute, infectious	*1*			
Diarrhea	*13*	4		
Diphtheria	3,346	205	2,818	179
Dysentery		22		
Erysipelas	9	1		
German measles	4,214	4	3,223	
Goiter	3	3		
Gonorrhea	1,758		1,539	
Influenza	179	156		288
Jaundice, contagious	*6*	*1*		
Lethargic encephalitis	16	12	21	16
Measles	13,405	19	18,420	42
Mumps	5,035		1,784	
Paratyphoid fever	1			
Pellagra		1		
Pneumonia		1,488		2,169

Disease	Year 1927		Year 1926	
	Cases	Deaths	Cases	Deaths
Poliomyelitis	51	15	71	6
Puerperal septicemia		5		
Rabies	1			
Scarlet fever	6, 289	42	5, 640	38
Smallpox	1, 523	2	706	3
Syphilis	1, 440	6	1, 256	
Tuberculosis	1, 534	732	1, 660	821
Typhoid fever	867	35	581	32
Whooping cough	5, 526	29	3, 679	67

Communicable diseases—Quebec—Week ended January 7, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended January 7, 1928, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Scarlet fever	108
Chicken pox	34	Smallpox	6
Diphtheria	66	Tuberculosis	13
German measles	11	Typhoid fever	4
Influenza	3	Whooping cough	4
Measles	100		

CANARY ISLANDS

Plague—Las Palmas.—A case of plague was reported at Las Palmas, Canary Islands, December 16, 1927.

CHILE

Campaign for prevention of tuberculosis—Housing and sanitary conditions.—Under date of November 2, 1927, the press in Chile was stated to be conducting a campaign for the prevention of tuberculosis through improvement in housing and sanitary conditions for the poorer classes.

CUBA

Communicable diseases—Provinces—October 2–December 24, 1927.—During the period from October 2 to December 24, 1927, cases of communicable diseases were reported from the provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Chicken pox		18	8	4		7	37
Diphtheria	5	23	25	22	8	8	91
Malaria	20	208	2	13	334	1, 447	2, 024
Measles	8	46	7	3	24	1	89
Paratyphoid fever	17	9	5	20	1	3	55
Poliomyelitis	1						1
Scarlet fever		8	1				9
Tetanus (infantile)			1		1		2
Typhoid fever	51	188	52	120	25	93	529

EGYPT

Plague—Alexandria—December 14, 1927.—On December 14, 1927, two cases of plague occurring in the same family were reported at Alexandria, Egypt. The focus of the disease was stated to be distant about 700 meters from the port and about 500 meters from the house in which the first case occurred.[1]

HAWAII TERRITORY

Plague rats—Paauhau—December 20, 1927.—Two plague-infected rats were reported found dead on the Paauhau sugar plantation, Paauhau, Hamakua, Island of Hawaii, December 20, 1927.

JAMAICA

Smallpox (alastrim)—November 27-December 31, 1927.—During the period November 27 to December 31, 1927, four cases of smallpox, reported as alastrim, were reported in the Island of Jamaica, occurring in localities not included in the Kingston area.

Other communicable diseases.—During the same period other communicable diseases were reported in the Island as follows:

Cases

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox		11	Poliomyelitis		1
Diphtheria		1	Puerperal fever		3
Dysentery	8	7	Tuberculosis	35	38
Erysipelas		1	Typhoid fever	39	99
Leprosy		1			

Population Island 926 000 Kingston 62 707

JAPAN

Dysentery—Tokyo, city and prefecture—October 30-November 26, 1927.—During the period October 30 to November 26, 1927, 144 cases of dysentery with 71 deaths were reported in the city of Tokyo, Japan, and 149 cases with 83 deaths in the prefecture of Tokyo, outside of the city. Population of city, 1,995,567; prefecture, outside of city, 2,489,577.

MADAGASCAR

Plague—October 1-15, 1927.—During the two-week period, October 1 to 15, 1927, 63 cases of plague with 59 deaths were reported in the island of Madagascar. The occurrence was reported in four Provinces as follows: Ambositra, 4 cases; Antisirabe, 2; Itasy, 5; Moramanga, 4; Tananarive, 48. Distribution by type of disease: Bubonic, 37; pneumonic, 2; septicemic, 24.

[1] Public Health Reports, Dec 30, 1927, p 3218, and Jan 6, 1928, p 42

PERU

Mortality, general—Mortality from communicable diseases—Lima city—October, 1927.—During the month of October, 1927, 385 deaths from all causes were reported in the city of Lima, Peru. Mortality from communicable diseases during the same period was reported as follows:

Disease	Deaths	Disease	Deaths
Cerebrospinal meningitis	9	Plague	1
Gastroenteritis	38	Tuberculosis	91
Influenza	7	Typhoid fever	5
Malaria	8		

Population, estimated, 196,767.

SALVADOR

Mortality, general—Mortality from communicable diseases—July–September, 1927.—During the three months ended September 30, 1927, 7,604 deaths from all causes were reported in the Republic of Salvador. Deaths from communicable diseases were reported as follows:

Disease	Deaths	Disease	Deaths
Diphtheria	4	Tuberculosis	174
Gastroenteritis	210	Typhoid fever	11
Measles	54		

Population, 1,600,000.

Prevailing diseases.—The diseases prevalent in the Republic during the period under report were stated to be intestinal disorders and malarial and other tropical fevers.

TRINIDAD

Vital statistics—Port-of-Spain—November, 1927.—The following statistics for the month of November, 1927, with comparisons for November of the years 1923 to 1926, are taken from a report issued by the Public Health Department of Port-of-Spain:

Month of November

	1923	1924	1925	1926	1927
Number of births	170	142	146	176	186
Births per 1,000 population	32.77	27.38	27.78	33.18	34.81
Number of deaths	126	124	132	126	118
Deaths per 1,000 population	24.29	23.91	25.11	23.75	22.08
Deaths under 1 year	21	26	25	24	17
Deaths under 1 year per 1,000 births	123.53	183.09	171.23	136.36	91.39

Cases of communicable diseases reported during November, 1927

	Cases		Cases
Diphtheria	3	Tuberculosis, pulmonary	10
Ophthalmia neonatorum	8	Typhoid fever	7
Pneumonia	3		

UNION OF SOUTH AFRICA

Plague—Orange Free State.—An outbreak of plague was reported in the Winburg District of the Orange Free State, Union of South Africa, during the week ended November 26, 1927, with 8 cases and 6 deaths. The outbreak occurred on a farm.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Sept. 3, 1927	Sept. 10	Sept. 17	Sept. 24	Oct. 1, 1927	Oct. 8	Oct. 15	Oct. 22	Oct. 29	Nov. 5, 1927	Nov. 12	Nov. 19	Nov. 26	Dec. 3, 1927	Dec. 10	Dec. 17	Dec. 24	Dec. 31
China:																			
Amoy	C	18	21	19	14	10	4	2											
	D	1	2																
Canton	C	10	17	7	2	6		2	6	5	1	6			1				
	D	6	10	7	2	6		2	6	5	1	5			1				
Foochow	C	P		P	P	P	P	P	P										
Hong Kong	C	1	P	P	P	P	P	P											
	D	1																	
Shanghai	C	1	3	2		1	2												
	D	25	22	21	6	4		2	1										
Swatow	C	P	P		P		P	P	P	P	P								
Tientsin	C	4	3	5	3	2													
India	C	11,180	8,391	6,630	5,189	4,907	4,055	6,142	5,056	5,303	4,845	5,987							
	D	5,559	4,278	3,532	2,526	2,549	2,104	3,027	2,691	2,867	2,641	3,350							
Bombay	C	1	1	1								2							
	D	1	1									2							
Calcutta	C	18	19	20	19	21	13	34	33	28	35	65	71	156					
	D	10	13	5	11	15	11	19	19	22	25	42	49	106	77	55	43	48	
Madras	C	29	8	15	7	4	9		1			6	7						
	D	24	11	6	7	3	3	1	1			3	4	1		1			
Rangoon	C				2	3	1		2		1		1	3					
	D				2	3	1		1	1		3	4	2	1	2	1	1	
Tuticorin	C					1									6		2		
	D					1				7	5	10	15		6	6	2		
India, French Settlements in	C	6	4	1															
	D	3	4	1															
Karikal	C	1									1								
	D	1									1								
Pondicherry	C	4	4	1	6						1								
	D	2	4	1	8						1								
Indo-China: Saigon	C						1			1									

Iraq:[1]																			
Amarah	C								35	4	8	3	2		1	1			
	D								23	6	8	3	2		1	1			
Baghdad	C								1		10	13	8	3	38				
	D								1		5	2	2	3	38				
Basra	C		21						1										
Diwaniyah	C								28	4	3	1	2						
	D								17	2			1						
Diyala	C														1				
	D														1				
Dulaim	C														1				
Hillah	C								12	7	3	5	53		7				
	D								7	6	2	1	29		4				
Kerbala	C								3	1	4	2	2						
	D								3	1	5	2	2						
Kut	C								11	9	1	5							
	D								8	4	1	3							
Muntafique	C								4			4	14		8				
	D								1			2	10		8				
Ramadi	C									19	18	27	21						
	D									10	23	14	16		1				
Java: Batavia	C										1	2	25	2					
	D										1	2	15	2					
Philippine Islands	C								4										
Siam	C	4	5	21		6	4	8	8	14	23	43	30	19					
	D	3	3	11		4	2	5	7	10	15	25	26	11					
Bangkok	C	1	1	1			2	3	1		1		3		1	1	1	2	
	D			1				3	1		1		1		1		1	2	
Straits Settlements: Singapore	C									1		4	2	1	2		2	3	
	D									1		4		2			2	1	
On vessel S. S. Tabaristan at Basra	C						1												

Place		September, 1927			October, 1927			November, 1927			December, 1927
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Indo-China (French)	C	452	206	241		345					
Annam	C	388	146	106		140	27	13	75	38	16
Cambodia	C	8	25	42		97	5	56	1	28	21
Cochin-China	C	17	35	92		79	12	21	27	52	17

Place		September, 1927			October, 1927			November, 1927			December, 1927
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Indo-China (French)—Con.											
Laos	C	16				29	6	10			
Tonkin	C	23		1						1	

[1] From July 24 to Oct 8, 1927, 831 cases and 617 deaths from cholera were reported in Iraq, of which 131 cases and 103 deaths occurred in Amarah; 416 cases and 337 deaths in Basra, 53 cases and 30 deaths in Diwaniyah, 7 cases and 5 deaths in Hillah; 31 cases and 18 deaths in Kerbala; 8 cases and 6 deaths in Kut, and 185 cases and 118 deaths in Muntafique.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Week ended—																
		September, 1927				October, 1927					November, 1927				December, 1927			
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31
Algeria: Oran	C		1																
	D		1								1		1						
Argentina:																			
Bahia Blanca District	C													1	1	1			
Cordoba Province	C					P	P	P	P	P	P			10				1	1
Firmat	C																1		
Quilino	C													1	1	1			
Rosario	C													1	1	1	1	2	3
Unacha	C																1		
Azores: St. Michaels Island	C		1		1	1			2	1		1	1	1	1	1			
	D		1			1										1			
British East Africa:																			
Tanganyiki	C				P	P		P	P	P	P								
Uganda	C	96	48	47	35	25	46	28											
	D	67	44	25	22	23	39	26											
Canary Islands: Las Palmas	C						4	4	1					1			2		
Ceylon: Colombo	C	1		1	1	2			1					1	1				
	D	1		1	1	1													
China: Tungliao	D							200											
Egypt:																			
Alexandria	C	1												5	2	2	2	1	
	D													5	2				
Suez	C		1																
Greece:																			
Mitylene	C				5		1			1		2		1	1	1			
Patras	C	2				1					1								
	D					1					1								
India	C	403	1,087	612	608	655	715	920	956	812	1,015	856							
	D	216	569	324	319	381	359	568	544	495	551	485							
Bombay	C	3	1	1	2		2		2										
	D	2	1	1	1		2		1										
Calcutta	C	18																	
	D	10																	

[illegible]	C	[illegible]	111	81	123	88	130	107	112		83	132							
	D	76	62	43	49	60	72	72	84		54	80							
Rangoon	C	2		4		3	4	1	3	5	2		4	5	2				
	D	2		4		3	4	1	3	5	2		4	5	2			2	
Indo-China: Saigon	C		1	1									1						
Java:																			
Batavia	C	18	14	17	21	24	33	42	31	41	29	31	34						
	D	18	14	17	21	24	33	41	31	41	29	31	34						
East Java and Madura	C	5	4	2	7	3	3	7	4	3	4	2	1						
	D	5	4	2	7	3	3	7	4	3	4	2	1						
Senegal:																			
Baol	C	32		27	13	39		56					P		P				
	D	11		15	7	26		14											
Cayor	C	81	103	175	104	101	45	20	10	32	8	8	P						
	D	27	58	90	58	57	16	10	5	20	4	4							
Dakar	C	9	5	5	1	1													
	D	4	4	3	1														
Louga	C				5		8												
	D				4														
Rufisque	C	4	9	2	1														
	D	3	7	1	1														
Thies	C	2		2	5					1									
	D	2		1	4														
Siam	C						1	11	1					2					
	D						1	8			1			1					
Bangkok	C						1		1										
	D										1								
Turkey: Constantinople	C				1	1								1					
	D					1													
Union of South Africa:																			
Cape Province—																			
Richmond District	C									2									
	D									2									
Orange Free State	C												1	8	P				
	D												1	6					
U. S. S. R.:																			
Chita District	C							1											
	D							1											
Northern Caucasus	C		3	1	10	1													
	D		2	1	7														
On vessel:																			
S. S. Aghios Gerasimos at Vigo, Spain	C												3						
At La Plata from Rosario, Argentina	C																		1

Indo-China (French), 20 cases, Sept. 1-Nov. 10; Beirut Syria, 1 case, Sept. 1-10; 1 case, Oct. 21-31; 1 case, Dec. 1-10.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

Place		July	August	September	October	November
Algeria: Algiers	C				2	
British East Africa. Kenya	C	13	61	21	18	
Ecuador: Guayaquil	C	5	7	3	4	9
	D					3
Madagascar	C	46	98	170	166	
	D	43	89	154	155	
Ambositra Province	C	6	1			
	D	6	1			
Antsirabe Province	C		34	5		
	D		34	4		
Itasy Province	C	14	11	21		
	D	14	7	20		

Place		July	August	September	October	November
Madagascar—Continued.						
Moramanga Province	C	5	4	3		
	D	5	4	3		
Tananarive Province	C	21	48	142		
	D	19	43	127		
Mauritius	C			1		
Peru	C	8	11	15	14	
	D	7	6	6	5	
Callao	D	3				
Lima	D	3			1	

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Week ended— September, 1927: 3	10	17	24	October, 1927: 1	8	15	22	29	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	Jan. 7, 1928
Algeria	C										294	218	149							
Algiers	C																3			
Oran	C										10	4	6	9	11	10	9			
Arabia: Aden	C												1		1		1			
Brazil: Rio de Janeiro	D			6						1										
British East Africa: Tanganyiki	D			8				7	P	P	P	P								
British South Africa:																				
Northern Rhodesia	C		18	16	5	10	97	44	13	150	10	22	3	57						
	D				2	3	7	1	4	40	23		1	18						
Southern Rhodesia	C												3							

Canada:																				
Alberta	C	3	1	5	8	5	4	5	9	6	2	1	1	7	3	3	6		3	
Edmonston	C									1				6		1	1			3
British Columbia—																				
Vancouver	C	2														4				
Manitoba	C	2		7			2		5	3	14		2	1	3	1	2	2		
Winnipeg	C			4			1		1				2			1	1	1		
New Brunswick	C			2														1		
Nova Scotia	C			1				1												
Halifax	C							1												
Ontario	C			12	10	6	26	26	38	64	38	77	85	71	90	82	104		53	
Hamilton	C														2					
Kingston	C												1					1		
Ottawa	C	9	13	12	6	3	15	23	26	47	17	51	19	10	19		34	18	9	20
Toronto	C		1		1		3	1	6	2	16	3	13		25	14		7		
Windsor	C							9												
Quebec	C								8	7	3	12	3	8	5	3		14	3	6
Montreal	C											1						1		1
Quebec	C														2		2		2	10
Riviere du Loup	C												3							
Saskatchewan	C	13	33		22	12		8	11	5	12	2	14	9	15	19	15	12	13	
Moose Jaw	C		9		7				3								1		1	2
Regina	C						5					1					1			
Saskatoon	C															2			4	
Ceylon: Colombo	C														1					
China.																				
Canton	C				1															
	D				1															
Chefoo	C				1			P		P				P						
	D				1															
Foochow	C		P					P	P		P			P						
Hong Kong	C	2																		
	D	1		1																
Manchuria—																				
Changchun	C													1						
Dairen	C								1		2									
	D								1											
Fushun	C			1								1								
Mukden	C					1			1	1										
Pensihu	C					1														
Tientsin	C					12			1	8				4	1					
Egypt	C	3													4					
	D	1				1														
Cairo	C														1					
Great Britain:																				
England and Wales	C	111	146	126	125	122	149	124	200	199	219	258	226	233	366	230	212	255		
Bradford	C									1	5	3	2	9	6	2	2	2		
Bristol	C								6	1			3	2	4	2				
Cardiff	C									1										
Leeds	C	3				3	1		6	1	1	1	2	3	3	6	4	4		
Manchester	C						1	2			1	1	4	2	5	10	8			
Newcastle upon Tyne	C			2		1		5		2	6		1	28	18	5	4	2	13	
Sheffield	C				1		3	3	4	4			2	1	8					

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

Place		Week ended— Sept. 3, 1927	Sept. 10	Sept. 17	Sept. 24	Oct. 1, 1927	Oct. 8	Oct. 15	Oct. 22	Oct. 29	Nov. 5, 1927	Nov. 12	Nov. 19	Nov. 26	Dec. 3, 1927	Dec. 10	Dec. 17	Dec. 24	Dec. 31	Jan. 7, 1928
India	C	1,456	1,109	1,111	722	923	593	777	860	779	805	1,235								
	D	397	266	284	173	179	159	171	206	190	200	211								
Bombay	C	7	3	1	1	4	2		4	2		2			4					
	D	5	2	1					2	2		1			1					
Calcutta	C	4	6	10	2		4	1					5	4	3					
	D	2	5	5	2		3	1	1				2	2	1					
Madras	C	2		3	2	3	1	2	2	3		2	2	2	2	5				
	D			1	1					1		1		1	1	1				
Rangoon	C	2		1	6	2	8		7	4		1	1	5	2					
	D	1			1	1	1		1	1				1	1					
India, French settlements in: Karikal	C				1															
	D				1															
Pondicherry	C	11	8	2	16	9	7	10	12											
	D	11	8	2	16	9	7	10	12											
Indo-China: Saigon	C		1																	
Iraq: Baghdad	C		1			5			2			5		1	5					
	D		1			3			1			4			5					
Basra	C			4				2					3							
	D			4				2					1							
Italy: Rome and vicinity	C		1																	
Jamaica (outside Kingston) (alastrim)	C	2	2	2	3	1	4	4		7				1		1	1		2	
Kingston (alastrim)	C	2		1			2													
Java: Batavia	C					3		1				25								
	D											15								
East Java and Madura	C		14	3	5	1		7		1	3	5								
	D							1												
Mexico: Acapulco	C	1		1								1								
	D	1		1								1								
Guadalajara	D													1			1			
Mexico City and surrounding territory	C													1	1	1	1			
Torreon	D						2													
Palestine: Jerusalem	C														1					

Portugal:																				
Lisbon	C	1		1	1	1	4	1	2	1	2									
Oporto	C		1																	
Siam	C	24	3				3	3					1							
	D	14	1																	
Bangkok	C												1							
Spain:																				
Malaga	D												1							
Valencia	C					1														
Union of South Africa:																				
Cape Province	C						P													
Orange Free State: Bothaville District	C												P	P	P					
Transvaal: Johannesburg	C													7						
Venezuela: Maracaibo	D			2			1													

Place		September, 1927			October, 1927			November, 1927			December, 1927
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Algeria	C	110	162	110	182	386	115				
Oran	C	4		12	6		5				
Indo-China	C	6	6	9	5	4	16	13	3	22	10
Syria:											
Beirut	C										1
Damascus	C		1	4	14	8			13		4

Place		July	August	September	October	November
Angola	C	42	2	5	73	
	D				2	
Congo	C			5	77	
Cuanza-Norte	C			1		
Cuanza-Sul	C				2	
Loanda	C			1		
Zaire	C			3		
Brazil: Porto Alegre	C	5	3	3	4	
British East Africa: Zanzibar	C				2	
	D				1	
Chosen	C	19	2			
	D	6				
Ecuador, Guayaquil	C		2	2	1	1
France	C	23	6	8	7	4
Gold Coast	C	1	1	5		
Greece	C	3	3	4	4	
Latvia	C				2	
Mexico	D	93	73	55		
Morocco	C	53	76	51	81	
Nigeria	C	492	91	237		
	D	83	20	70		
Spain: Madrid	D					1
U. S. S. R.:						
Railways, etc.	C	11	6			
Other territories in Europe	C	146	111			
Transcaucasus, Siberia and Central Asia	C	36	29			
Ukraine	C	16	4			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continu

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Week ended—																
		September, 1927				October, 1927					November, 1927				December, 1927			
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24
Bulgaria: Sofia	C					8	4	3	2	3	1	2					1	
	D										1							
Chile:																		
Antofagasta	D					1												
Valparaiso	C	1												1	1			
	D	1											1					
China:																		
Manchuria: Harbin												1						
Tientsin	C				2													
Egypt	C					3	3	5	1		4			1	7			
	D					2	1	1	1						5			
Port Said	C					1									1			
Ireland:																		
Cork County	C															3		
Donegal County—Letterkenny	C								4									
Mexico: Mexico City (including municipalities in Federal District)	C	9	4	1	5	7		3	8	9	6	2	11	7	6	4		4
	D										2						1	1
Palestine	C	3		5			3						2	3	1			
Haifa	C						2						1	1				
Herzliah	C													1				
Jaffa	C					1								1				
Nazareth	C												1					
Safad	C													1				
Tel-Aviv	C						1							1	1			
Poland	C	12	5	12	6	10	9			35	12	6			28			
	D			2		3	1			6	3				5			
Portugal: Oporto	C									1								1
Rumania	C	2	2	9	3	5							2					
	D					1												

Syria: Aleppo	C			2														
Tunisia	C			1				2	1			1						
Union of South Africa:																		
Cape Province	C	P				P	P	P	P		P	P	P	P	P			
Natal	C								P		P	P	P	P	P			
Orange Free State	C					P												
Transvaal	C										P	P	P	P	P			
Johannesburg	C							5										

Place		September, 1927			October, 1927			November, 1927			December, 1927
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Algeria	C	5	3	2	7	4	1				
	D					1					
Algiers	C	1	5		1	1					
Bulgaria	C	5	1	1		1	1				
	D		1	1		1					
Morocco	C	3	2	2	6	4	1	5	14	7	5

Place		July	August	September	October	November
Argentina	C					1
Chosen	C	72	17			
	D	8				
Chemulpo	C	1	2			
Gensan	C	2				
Seoul	C	2	3		2	
	D	1			1	
Czechoslovakia	C	6				
Greece: Athens	C	1				
Japan	C	1				
Latvia	C	6				
Lithuania	C	44	18	7	9	
	D	3	8	1	1	

Place		July	August	September	October	November
Mexico	D	12	38	14		
Peru:						
Arequipa	D		2	1	2	
Lima	D	8				
U. S. S. R.:						
Railways, etc	C	30	22			
Transcaucasus, Siberia, and central Asia	C	79	69			
Ukraine	C	96	85			
Other territories in Europe	C	732	552			
Yugoslavia	C	11	9		1	1
	D	4	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C, indicates cases; D, deaths; P, present]

Place		Week ended—																
		September, 1927				October, 1927				November, 1927				December, 1927				
		3	10	17	24	1	15	22	29	5	12	19	26	3	10	17	24	31
Belgian Kongo: Boma and Matadi	C																	7
Dahomey: Grand Popo	C												1					
	D												1					
Liberia: Monrovia	C		1															
Nigeria	C			2														
	D			2														
Senegal	C					5		5	9	16	6	7						
	D					5		4	8	10	4	6						
Dakar	C			P					3	6		5	2	1	4			
	D								2	4		4	2	1	4			
Geoul	C					1												
	D					1												
Goree, Island of	C	2																
	D	2																
Kebener	C						1	1										
	D						1	1										
Kelle	C						2		1									
	D						1		1									
Keur Samba Kane	C								1	1								
	D									1								
Keur Madiop	C								1									
	D								1									
Khombole	C					1						1						
	D					1						1						
Louga	C					1			2	1	1							
	D					1			2	1	1							
Mekhe	C							1	1	2	2							
	D								1	1	1							
M'Dande	C							1		2	1							
	D							1		1								
Pout	C				1													
	D				1													

Rufisque	C						1											
	D						1											
St. Louis	C					1												
	D					1												
Sebikotane	C							1		2	1							
	D							1			1							
Thies	C			1	2	1		1	1	2	1	1						
	D			1	2	1		1	1	2	1	1						
Tiaroye	C	1																
	D	1																
Tivaouane	C		1															
On vessel S. S. Desirado, at Leixoes, Portugal	C			1														
	D			1														

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

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SPECIAL ARTICLES

Prevalence of Influenza in the United States

Tularaemia among Meadow Mice in California

Reports of the Health Section, League of Nations

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

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PUBLIC HEALTH REPORTS

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PREVALENCE OF INFLUENZA IN THE UNITED STATES

During the year 1927 comparatively few cases of influenza were reported. During the first four months of the year the contrast with the corresponding period of 1926 was marked.

The following table gives the number of cases of influenza as reported by 28 States for 52 weeks of the years 1925, 1926, and 1927:

Cases of influenza reported by 28 States for 52 weeks

	Cases
[illegible]	[illegible]
1926	110, 494
1927	36, 373

The estimated population of these States in 1927 was 62,771,000. At the close of the year the comparison is not so favorable for the year 1927, although there are no indications of any unusual prevalence of influenza. The following table gives, by four-week periods, the numbers of cases reported by the health officers of 28 States for the last 20 weeks of the years 1925, 1926, and 1927:

Influenza cases reported by four-week periods for the last 20 weeks of years 1925, 1926, and 1927

Four weeks ended—	Corresponding weeks—		
	1927	1926	1925
Sept. 10, 1927	629	683	495
Oct. 8, 1927	777	966	569
Nov. 5, 1927	1, 429	2, 087	1, 559
Dec. 5, 1927	2, 022	2, 446	2, 256
Dec. 31, 1927	3, 035	2, 946	3, 015
Total	7, 892	9, 128	7, 894

The death rates from influenza and pneumonia, all forms (combined), during the 10-year period from 1917 to 1926, inclusive, in the registration area, were as follows:

Death rates per 100,000 from pneumonia, all forms, and influenza (combined) in the registration area

1917	167. 8	1922	133. 5
1918	537. 0	1923	153. 7
1919	222. 3	1924	117. 7
1920	208. 3	1925	123. 1
1921	99. 8	1926	143. 2

TULARAEMIA AMONG MEADOW MICE (*Microtus californicus aestuarinus*) IN CALIFORNIA

By J. C. PERRY, *Senior Surgeon, United States Public Health Service*

During September, 1927, Messrs. Stanley E. Piper and W. P. Garlough, of the United States Biological Survey, while investigating conditions in a selected area in Contra Costa County, Calif., preliminary to placing thalium poison for squirrel eradication, noted that there was a heavy infestation with both wood rats and meadow mice (*Microtus californicus aestuarinus*) and that some epidemic disease existed among the mice, as large numbers of dead and sick mice were found. These men were familiar with the migration and disease in the meadow mice that occurred in Kern County, Calif., in 1926, as well as with the bacteriological findings of Surg. N. E. Wayson [1] in his investigation of that disease. They thought that probably the same disease found in the mice in Kern County was responsible for the mortality noted among those in Contra Costa County and that it would be of value and interest to determine whether this was true or whether some other disease was the responsible factor.

An inquiry was made as to whether the United States Public Health Service plague laboratory at San Francisco would undertake the examination of some of these mice, and upon being answered that it would do so, two mice were sent to the laboratory on September 24, 1927.

Upon dissection, these mice showed no gross pathological lesions and none of the appearances noted in mice dying from mouse septicemia. However, smears from the spleen showed numerous thin, short bacilli that presented the appearances of *Bacterium tularense*.

Inoculations of animals were made by grinding up the spleens of the mice and using a portion of this material subcutaneously. Two white mice and one white rat were inoculated from each of the original wild mice. Therefore, two series of experiments were run and may be designated as first and second series. At the same time, September 24, inoculations were made from the spleens on agar plates.

FIRST SERIES

The two white mice and the rat inoculated on September 24 died on September 26. There was some subcutaneous fluid at point of inoculation, but no morbid changes were seen in the spleen, liver, or lungs. The absence of gross pathological lesions was probably due to the early death of the animals. Microscopic preparations made from the subcutaneous fluid showed numerous small organisms like

[1] Wayson, N. E. An epizootic among meadow mice in California, caused by the bacillus of mouse septicemia or of swine erysipelas. Pub. Health Rep., 42: 1489-1493, (June 3) 1927.

those seen in smears from the wild mice. This fluid was plated on plain agar, but no growth of the thin, short rods occurred.

On September 26, two guinea pigs were inoculated from the spleen of one of the wild mice. One inoculation was subcutaneous and the other was pocketed.

SECOND SERIES

The white mice inoculated on September 24 from the second wild mouse died on September 28. Their spleens were enlarged, dark in color, and quite firm. The lymphatic glands were enlarged. Liver and spleen were not stippled. Many organisms of the same type as previously mentioned were found in microscopic preparations made from the spleen and enlarged glands. The rat was killed on September 30. Its spleen was slightly enlarged and firm, and showed some white punctate spots (stippling). Smears of the spleen showed thin, short rods.

Two guinea pigs were inoculated from the spleen and glands of a white mouse of the second series that died on September 28.

GUINEA PIGS

The pigs inoculated on September 26 from the spleen of one of the wild mice died on October 6, living nine days. The pigs (second series) inoculated on September 28 died on October 4 and 5, respectively.

The gross pathological findings were the same in all four pigs. The spleens were enlarged, dark in color, and finely studded with small, white punctate spots (markedly stippled). The livers were also stippled. The lesions were typical of tularaemia.

CULTURES

As no growth had occurred on ordinary culture media, cultures were made on coagulated egg yolk medium from the spleens of the guinea pigs that died on October 5. A pearly growth occurred on this medium, which conformed in morphological and cultural characteristics to that of a strain of *Bacterium tularense* which has been maintained in the laboratory since 1919.

Two guinea pigs were inoculated from these cultures on October 12, one of which was killed on October 17 while very sick and the other died the following day. The gross lesions in the pigs inoculated with cultures were the same as those noted above in pigs which had been inoculated with mouse tissue.

Cultures obtained from the spleen of the pig that died October 18 bore the morphological and cultural characteristics of *Bacterium tularense*.

DISCUSSION

The demonstration of tularaemia in the meadow mice submitted was effected by careful observance of laboratory procedure. Upon dissection they showed no gross morbid changes and might have been discarded by a less trained worker than the technician in this laboratory, who is familiar with both tularaemia and mouse septicemia, including both the pathology and bacteriology of these diseases. Credit is due Michael Burkel, the laboratory technician, for excellent work in carrying out this investigation under the direction of the writer.

Pigs inoculated with this strain often die in six or seven days. However, animals inoculated by simply rubbing the diseased spleen on a scarified area will live several days longer than when the inoculation is made from material of the ground spleen. One pig inoculated by the former method lived 14 days.

Guinea pigs that live 10 or 14 days are more likely to show lung lesions of tularaemia, and the one of our series that lived 14 days showed the entire lungs studded with white spots. No stippling was noted in the lungs of any of the other pigs

The spleens of the inoculated guinea pigs may be firm, almost granular on maceration, or softened. This seems independent of the length of time the pig lives, and occurred in equal proportion in our series.

It was noted in isolating cultures that material secured by searing the surface of the spleen and passing a loop through this area very often did not result in any growth; but when ground spleen pulp was used as an inoculum, the surface of the spleen having been previously sterilized by dropping it into boiling water, satisfactory results followed.

It was noted that a much larger number of organisms was present in smears made from the spleens of mice than in those made from the spleens of rats and guinea pigs. This held equally true for the wild mice and the white mice in the laboratory.

Meadow mice harbor mites. This was noted in the examination of those from Kern County, Calif., in 1926; and since the mice migrate for food and live together in nests, transmission of tularaemia among them by mites is probable.

SUMMARY

Two meadow mice (*Microtus californicus estuarinus*) collected in nature in Contra Costa County, Calif., where large numbers of sick and dead mice were found, were sent to the United States Public Health Service plague laboratory in San Francisco for examination on September 24, 1927. Spleens of the wild mice were inoculated into

white mice, white rats, and guinea pigs, causing the typical lesions of tularaemia, and from the latter *Bacterium tularense* was isolated. The organism was a slender, short rod, Gram-negative, nonmotile, and grew only on coagulated egg yolk and blood glucose cystine agar, and not on ordinary plain agar. It was agglutinated out to the full anti-*tularense* titre (1:1280) of a known anti-*tularense* serum. Sections of the liver of infected white mice showed the hepatic cells packed with these organisms. Spleen tissue rubbed on the abraded skin of a guinea pig caused its death with the typical lesions of tularaemia—caseous lymph glands, spotted spleen, and spotted liver.

This is the first record of *Bacterium tularense* having been isolated from naturally infected wild mice.

CURRENT PREVALENCE OF DISEASE

REVIEW OF THE MONTHLY EPIDEMIOLOGICAL REPORT OF THE HEALTH SECTION OF THE LEAGUE OF NATIONS' SECRETARIAT, PUBLISHED AT GENEVA, DECEMBER 15, 1927 [1]

Plague.—Only sporadic cases of plague were reported during the autumn months in the Mediterranean area. In Egypt, no case was reported from September 11 to November 12; in the following two weeks, five cases occurred at Alexandria.

No case of plague had been reported from Syria since September 17. No plague was reported from Tunisia between August 7 and November 20. In Algeria, 1 plague case was reported at Algiers and 2 cases were reported at Oran during the first 5 days of November; an additional case was reported at Oran on November 17.

In Greece, plague cases occurred in only two centers—at Patras and Plomarion on the island of Mytilene (Lesbos). There were 2 cases at Patras in September and 3 cases in November; at Plomarion there were 6 cases in September, 3 in October, 3 in November, and 1 on December 1. A Greek steamer was sent to the quarantine station at Vigo, in Spain, on November 19, three plague cases having occurred on board.

Two cases of pneumonic plague occurred on November 30 at Las Palmas on the Canary Islands.

Plague incidence was declining during September and October, or was lower than in preceding months, in Kenya, Nigeria, Uganda, and Senegal. In Uganda, the cases reported in 1927 up to October 15 numbered 1,908, which is more than were reported in any of the preceding five years, but a much lower number than was reported in 1921.

[1] From the Office of Statistical Investigations.

October returns from Madagascar (166 cases) were lower than for the corresponding month of the preceding two years; the seasonal maximum usually is reached in December or January. In the Union of South Africa three cases of plague were reported between October 16 and November 19 on inland farms.

Plague incidence in India up to the end of October had been much lower than the mean incidence in preceding years. The incidence in the various provinces of India is described in the Report (a monthly publication), as follows:

> Excluding Burma, no plague has been reported anywhere east of Azamgarh in the United Provinces. During the nine weeks ended October 15, there were 33 deaths attributed to plague in the United Provinces and 33 in the Punjab, inclusive of native States; the corresponding figures for 1926, which was also a very favorable year, were 104 and 306, respectively. During the nine weeks, 192 deaths from plague were reported in the Central Provinces, as compared with 932 during the corresponding period of the preceding year. The incidence is lower than last year in Hyderabad and Mysore, and about the same in the Bombay and Madras Presidencies. Plague is usually at its maximum in September or October in the Deccan, but during the week ended October 15 there was a marked increase of plague in the Districts of Dharwar and Satara in the Bombay Presidency. Weekly returns of plague deaths in Burma have constantly been between 20 and 40 since July.

In Siam, 24 plague cases were reported in the first 10 months of 1927, of which 9 occurred at Bangkok. During the same period, 73 cases were reported in Cambodia, 17 in Cochin-China, and none elsewhere in French Indo-China.

No plague case had been reported from any Chinese port since early in August, when plague was present at Amoy.

The Argentine Republic reported cases of plague as occurring in several inland localities. Ten cases were reported at the end of October in the Province of Cordoba with another case in the latter part of November; 1 case was reported on November 14 near Bahia Blanca, and 1 case on November 26 at Rosario.

In Peru, fewer cases of plague were reported during the first 9 months of 1927 (168 cases) than during any of the preceding 15 years.

Cholera.—No case of cholera was reported in ports west of Bombay during the five weeks ended December 3. The last case occurred at Basrah on October 15, and Lingah was declared free from cholera on November 26. The total number of cholera cases reported in Iraq showed no decrease in the first half of November (281 cases were reported during the 4 weeks ended November 19, as compared with 270 during the preceding 4 weeks) although the epidemic was under complete control in the original centers of infection. A comparison of the incidence in the present epidemic with that in the previous epidemic of 1923 is given in Table 1.

Table 1.—*Cholera cases and deaths reported in Iraq, by Provinces, during the epidemics of 1923 and 1927*

Province	July 17 to Nov. 11, 1927		Aug 11 to Nov. 23, 1923	
	Cases	Deaths	Cases	Deaths
Basrah Liwa:				
Basra town	350	276	605	436
Other localities	24	15	0	0
Amarah Liwa.				
Amarah town	114	87	75	41
Other localities	63	50	125	78
Muntafiq Liwa	174	104	178	122
Diwaniyah Liwa	120	72	5	1
Baghdad Liwa:				
Baghdad town	3	2	134	92
Other localities	22	8	41	22
Kut Liwa:				
Kut town	12	8	6	2
Other localities	60	39	56	15
Hillah Liwa	88	54	19	12
Kerbalah Liwa	74	55	163	115
Dulaim Liwa:				
Ramadi town	7	7	0	0
Other localities	75	53	25	15
Diyalah Liwa	0	0	208	146
Total	1,186	830	1,640	1,097

A fresh outbreak of cholera in Bengal caused the total incidence in India to increase in October in spite of a substantial decrease in the Deccan as well as in the Upper and Middle Ganges Plain. Deaths from cholera in the various Provinces of India in recent months are shown in Table 2.

Table 2.—*Deaths from cholera in the Provinces of India, by fortnightly periods, from July 3 to October 22, 1927*

Province	July 3 to 16	July 17 to 30	July 31 to Aug 13	Aug 14 to 27	Aug 28 to Sept. 10	Sept. 11 to 24	Sept. 25 to Oct. 8	Oct. 9 to 22
Punjab and Delhi	1,312	986	275	351	290	158	26	2
Punjab States	269	205	13	37	9	129	43	39
United Provinces	1,250	1,126	903	617	248	213	169	140
Central India Agency	420	381	276	411	518	92	-------	10
Bihar and Orissa	2,716	2,877	2,254	2,176	1,343	851	537	429
Bengal	444	650	679	672	530	916	1,318	2,619
Assam	110	89	178	295	292	311	290	570
Central Provinces	728	696	818	1,986	2,596	1,723	1,059	550
Madras Presidency	2,455	2,352	1,975	1,538	985	614	522	520
Hyderabad	322	653	1,097	1,312	1,777	1,095	[1] 179	395
Bombay Presidency	1,584	1,814	2,291	2,014	1,206	506	439	354
States in Bombay Presidency	192	246	170	36	24	9	98	13
Burma	73	141	162	118	63	66	129	97
Other Indian States	94	17	18	27	4	6	1	0
Total	11,969	12,233	11,109	11,590	9,885	6,689	4,810	5,738

[1] One week only.

Cholera continued to decrease in French Indo-China. During the first 20 days of November 105 cases were reported in Cambodia, Cochin-China, and southern Laos, 88 in Annam, and none in Tonkin. In Siam there were 53 cases in the four weeks ended November 5.

The Philippine Islands were practically free from cholera during 1927.

Yellow fever.—The incidence of yellow fever in Senegal decreased markedly in the second half of November. Sixteen cases were reported during the four weeks ended November 29, of which 7 were at Dakar, 3 at Thies, 2 each at Mekke and Sebikotane, and 1 each at Louga and Khombole. Six of these cases were among Europeans.

One case was reported on November 21 at Grand Popo in Dahomey.

Only one case was reported in October in the Gold Coast Colony, at Koforidua.

Smallpox.—The following reports of smallpox were recorded from continental European countries in October:

Seven cases in France, 4 cases in Greece, and 2 cases in Latvia. Reports for October have not as yet been received from Italy, Spain, and the U. S. S. R. In Italy there were 2 cases during the four weeks ended September 25. Four cases were reported in the Ukraine in August.

The incidence of mild smallpox in England and Wales increased in November but was not higher than at the corresponding season of last year. During the four weeks ended December 3 there were 1,083 cases, as compared with 1,200 during the corresponding four weeks of 1926.

In Algeria the severe type of smallpox has been prevalent during 1927. In October and November its incidence increased; 683 cases were reported in October, and 661 cases in the three weeks ended November 19. The epidemic is most extensive in the department of Oran. In Tunis 45 cases of smallpox were reported during the four weeks ended November 27.

An outbreak of severe smallpox in Northern Rhodesia is indicated by the report for October. In the five weeks ended November 4, 317 cases and 75 deaths were reported, as compared with 183 cases and 22 deaths in the third quarter of last year.

Enteric fever.—The seasonal maximum incidence of enteric fever was later than usual in most European countries, and nearly everywhere the disease was more prevalent than in 1926. Only in Germany, the Netherlands, and Sweden was the incidence in 1927 considerably lower than in 1926. The disease has been much more prevalent than in the preceding year in Poland, Rumania, the Kingdom of the Serbs, Croats and Slovenes, Bulgaria, Greece, and Italy. The incidence in European countries in the past year is compared with that in the preceding year in Table 3.

TABLE 3.—*Enteric fever cases reported in European and certain other countries, by quarters, 1925–1927*

Country	1925		1926				1927				
	III	IV	I	II	III	IV	I	II	III	IV	Up to—
Germany	5,913	2,330	1,254	1,580	6,334	3,220	1,253	1,476	3,069	988	Nov. 12
England and Wales	995	700	491	577	1,005	668	464	779	1,233	948	Dec. 3
Austria	1,046	720	395	439	952	590	251	456	1,024	220	Nov. 12
Belgium	410	274	174	161	366	237	143	218	281	254	Dec. 3
Bulgaria	899	1,319	416	235	547	1,479	478	254	1,078	744	Oct. 31
Denmark	163	48	27	53	116	45	21	36	120	60	Do.
Scotland	96	47	42	52	109	57	40	41	110	79	Dec. 3
Estonia	310	247	133	125	238	187	111	137	292	91	Oct. 31
Irish Free State	143	114	30	26	26	34	83	78	80	73	Dec. 3
Finland	575	335	159	308	527	280	89	182	531	187	Nov. 15
France	2,146	1,852	1,598	1,314	2,351	2,851	1,729	1,456	2,482	811	Oct. 31
Greece	275	575	159	85	278	324	896	178	946	283	Nov. 15
Hungary	2,063	2,236	978	490	3,119	3,362	933	608	2,930	1,432	Oct. 31
Italy	9,955	8,604	2,302	2,818	13,507	17,022	5,068	4,810	16,727	---	Sept. 25
Latvia	368	209	160	177	310	217	164	158	337	101	Oct. 31
Lithuania	191	172	152	163	266	258	132	160	283	76	Do.
Malta	117	125	36	54	122	175	116	154	235	------	------
Norway	100	39	19	28	45	32	22	29	179	5	Oct. 31
Netherlands	477	270	243	158	483	337	112	149	309	158	Dec. 3
Poland	4,538	3,549	2,528	2,026	5,496	5,883	2,812	2,414	6,794	5,015	Nov. 19
Rumania	2,736	2,459	860	396	1,788	2,190	649	443	2,675	1,946	Nov. 6
Kingdom of Serbs, Croats, and Slovenes	1,324	1,494	590	308	1,106	1,973	577	429	1,878	1,316	Nov. 21
Sweden	544	186	87	96	477	172	63	93	164	84	Nov. 15
Switzerland	166	84	49	113	116	146	67	101	160	66	Dec. 3
Czechoslovakia	2,325	2,012	1,210	933	2,336	2,508	1,147	1,286	2,733	1,185	Oct. 31
Algeria	175	229	114	189	162	374	86	105	239	140	Nov. 19
Egypt	766	518	345	519	868	539	236	469	1,155	370	Nov. 18
Tunis	160	159	80	82	95	142	51	83	133	106	Dec. 4

Influenza.—No unusual prevalence of influenza had been reported by any European country up to the middle of December.

Lethargic encephalitis.—A decrease in cases of lethargic encephalitis in 1927 is noted in the reports of the few countries in which this disease is notifiable. In England and Wales, 1,483 cases had been notified up to December 3, 1927, as compared with 2,120 cases in 1926, 2,483 cases in 1925, and 4,825 cases in 1924.

Acute poliomyelitis.—The epidemic of poliomyelitis in Germany decreased rapidly in the second half of October and in November. The center of the epidemic was the Province of Leipzig.

In Denmark, fewer cases of poliomyelitis were reported in 1927 than for several years past, and the incidence in Sweden, though higher than in 1926, was lower than in 1924 or 1925.

DEATHS FROM AUTOMOBILE ACCIDENTS IN 76 LARGE CITIES OF THE UNITED STATES, 1926 AND 1927

The Department of Commerce announces that for the 52-week periods ended December 31, 1927, and January 1, 1927, the total numbers of deaths resulting from automobile accidents in 76 large cities of the United States were, respectively 7,016 and 6,586, indicating a death rate for this cause of 22 per 100,000 population in 1927

as compared with a rate of 21 in 1926—an increase of 5 per cent in the rate last year. The following table gives the number of deaths from such accidents and the death rates per 100,000 population for these cities for each of the two years:

Number of deaths from automobile accidents and death rates for 76 large cities of the United States, 1926 and 1927

(From the Bureau of the Census, Department of Commerce)

City	Deaths from automobile accidents, 52 weeks ended—				Death rate from automobile accidents per 100,000 population, 52 weeks ended—			
	Dec. 31, 1927		Jan. 1, 1927		Dec. 31, 1927		Jan. 1, 1927	
	Total deaths	Deaths due to accidents in city	Total deaths	Deaths due to accidents in city	For total deaths	For deaths due to accidents in city	For total deaths	For deaths due to accidents in city
Total (76 cities)	7,016	([1])	6,586	([1])	22.0	([1])	21.0	([1])
Akron	70	45	54	([1])	([2])	([2])	([2])	([1])
Albany	34	17	40	22	28.5	14.3	33.8	18.6
Atlanta	63	52	67	48	25.4	20.9	27.5	19.7
Baltimore	160	131	176	134	19.6	16.0	21.9	16.6
Birmingham	55	33	52	31	25.4	15.2	24.8	14.8
Boston	133	112	148	130	16.8	14.2	18.9	16.6
Bridgeport	24	19	28	19	([2])	([2])	([2])	([2])
Buffalo	126	107	139	([1])	23.0	19.5	25.6	([1])
Cambridge	25	([1])	18	([1])	20.2	([1])	14.8	([1])
Camden	64	22	53	22	48.2	16.6	40.6	16.9
Canton	44	38	32	([1])	38.9	33.6	29.2	([1])
Chicago	760	748	670	658	24.6	24.2	22.0	21.6
Cincinnati	130	([1])	124	([1])	31.6	([1])	30.3	([1])
Cleveland	243	224	257	([1])	25.1	23.1	26.8	([1])
Columbus	71	63	68	([1])	24.4	21.7	23.9	([1])
Dallas	46	34	54	42	21.8	16.1	26.7	20.8
Dayton	32	([1])	45	([1])	17.8	([1])	25.6	([1])
Denver	57	43	48	36	19.7	14.9	16.9	12.6
Des Moines	24	22	23	([1])	16.2	14.8	15.8	([1])
Detroit	386	382	355	([1])	29.0	28.7	27.6	([1])
Duluth	16	13	27	24	14.0	11.4	24.0	21.4
El Paso	28	21	19	12	24.7	18.6	17.4	11.0
Erie	37	35	40	([1])	([2])	([2])	([2])	([1])
Fall River	12	10	19	12	9.1	7.6	14.5	9.2
Flint	41	([1])	32	([1])	28.8	([1])	23.5	([1])
Fort Worth	28	27	25	22	17.2	16.5	15.7	13.9
Grand Rapids	34	22	31	12	21.1	13.6	19.9	7.7
Houston	46	42	34	32	([2])	([2])	([2])	([2])
Indianapolis	68	46	86	78	18.2	12.3	23.5	21.3
Jersey City	60	58	41	35	18.7	18.1	12.9	11.0
Kansas City, Kans	19	9	4	1	16.2	7.7	3.4	.9
Kansas City, Mo	78	63	83	72	20.4	16.5	22.2	19.2
Los Angeles	301	276	226	214	([2])	([2])	([2])	([2])
Lowell	15	11	22	([1])	13.6	10.0	20.0	([1])
Lynn	13	12	12	12	12.4	11.5	11.6	11.6
Memphis	61	32	43	([1])	34.2	17.9	24.4	([1])
Milwaukee	119	108	94	([1])	22.2	20.2	18.2	([1])
Minneapolis	62	50	68	40	13.9	11.2	15.7	11.3
Nashville	45	27	39	20	32.7	19.6	28.5	14.6
New Bedford	12	9	8	([1])	10.1	7.5	6.7	([1])
New Haven	49	21	46	27	26.6	11.4	25.4	14.9
New Orleans	95	70	89	([1])	22.4	16.5	21.3	([1])
New York	1,084	1,081	1,059	1,054	18.2	18.2	17.9	17.8
Newark, N. J	116	108	95	([1])	25.6	23.8	20.7	([1])
Oakland	54	44	55	51	20.3	16.5	21.2	19.6
Oklahoma City	21	21	27	([1])	([2])	([2])	([2])	([1])
Omaha	53	39	28	([1])	24.2	17.8	13.0	([1])
Paterson	52	31	25	12	36.3	21.6	17.6	8.4
Philadelphia	321	321	337	([1])	15.8	15.8	16.8	([1])
Pittsburgh	214	163	161	([1])	32.2	24.6	25.3	([1])
Portland, Oreg	51	39	39	([1])	([2])	([2])	([2])	([1])
Providence	59	33	63	([1])	21.1	11.8	23.0	([1])
Richmond	43	28	39	20	22.5	14.6	20.7	10.6
Rochester	62	47	66	53	19.2	14.5	20.6	16.6

[1] Not reported.

[2] Mortality rates are omitted, pending the establishment of more satisfactory estimates of population.

Number of deaths from automobile accidents and death rates for 76 large cities of the United States, 1926 and 1927—Continued

(From the Bureau of the Census, Department of Commerce)

City	Deaths from automobile accidents, 52 weeks ended—				Death rate from automobile accidents per 100,000 population, 52 weeks ended—			
	Dec. 31, 1927		Jan. 1, 1927		Dec. 31, 1927		Jan. 1, 1927	
	Total deaths	Deaths due to accidents in city	Total deaths	Deaths due to accidents in city	For total deaths	For deaths due to accidents in city	For total deaths	For deaths due to accidents in city
St. Louis	149	137	183	165	17.8	16.4	22.1	19.9
St. Paul	50	43	41	(1)	20.0	17.2	16.6	(1)
Salt Lake City	26	25	31	(1)	19.2	18.5	23.3	(1)
San Antonio	44	33	40	(1)	20.9	15.7	19.6	(1)
San Diego	37	26	47	37	32.2	22.6	42.8	33.7
San Francisco	126	122	121	112	21.9	21.2	21.4	19.8
Schenectady	12	8	23	(1)	12.9	8.6	24.8	(1)
Seattle	79	68	66	61	21.1	18.2	18.0	16.7
Somerville	10	9	14	(1)	9.9	8.9	14.0	(1)
Spokane	20	16	27	(1)	18.4	14.7	24.8	(1)
Springfield, Mass	25	14	35	23	17.0	9.5	24.2	15.9
Syracuse	39	26	43	31	19.9	13.2	23.3	16.8
Tacoma	30	22	20	(1)	28.1	20.6	19.0	(1)
Toledo	108	81	74	(1)	35.5	26.6	25.1	(1)
Trenton	43	24	34	15	31.5	17.6	25.4	11.2
Utica	17	9	19	(1)	16.5	8.7	18.6	(1)
Washington, D. C	107	78	98	74	19.9	14.5	18.6	14.1
Waterbury	13	13	15	(1)	(2)	(2)	(2)	(1)
Wilmington, Del	40	33	28	(1)	31.7	26.2	22.6	(1)
Worcester	48	30	31	(1)	24.6	15.4	16.1	(1)
Yonkers	22	21	20	(1)	18.6	17.7	17.2	(1)
Youngstown	55	53	43	(1)	32.6	31.4	26.2	(1)

[1] Not reported.
[2] Mortality rates are omitted, pending the establishment of more satisfactory estimates of population.

DEATHS FROM AUTOMOBILE ACCIDENTS BY FOUR-WEEK PERIODS, APRIL 26, 1925, TO DECEMBER 31, 1927

The following table gives the total number of deaths from automobile accidents in 76 large cities, by four-week periods, from April 26, 1925, to December 31, 1927. The lowest number of deaths from this cause for a four-week period during this time was 345, for the period ended March 27, 1926, and the highest was 681, for the four weeks ended November 5, 1927.

Total number of deaths from automobile accidents in 76 large cities of the United States, by four-week periods, April 26, 1925, to December 31, 1927

Four weeks ended—

1925		*1926*		*1927*	
		Jan. 2	543	Jan. 1	518
		Jan. 30	422	Jan. 29	408
		Feb. 27	369	Feb. 26	437
		Mar. 27	345	Mar. 26	430
		Apr. 24	421	Apr. 23	484
May 23	417	May 22	492	May 21	521
June 20	490	June 19	544	June 18	499
July 18	490	July 17	481	July 16	570
Aug. 15	464	Aug. 14	495	Aug. 13	503
Sept. 12	518	Sept. 11	557	Sept. 10	525
Oct. 10	522	Oct. 9	644	Oct. 8	657
Nov. 7	604	Nov. 6	671	Nov. 5	681
Dec. 5	616	Dec. 4	627	Dec. 3	616
				Dec. 31	623

COURT DECISIONS RELATING TO PUBLIC HEALTH

Milk ordinance held valid.—(Oregon Supreme Court; Korth *v.* City of Portland et al.; Georgeson *v.* Same, 261 P. 895; decided November 29, 1927.) Suits were brought against the city of Portland by which it was sought to restrain the enforcement of an ordinance relating to milk sold within the city. The ordinance prescribed various requirements relative to the production and handling of milk, all of which were designed to secure the purity of same, and also imposed a license fee. The plaintiffs produced milk on dairy farms outside of the city, but sold the milk within the city. One of the contentions against the ordinance was that it was an attempt to exercise extraterritorial power. But the supreme court held adversely to this view, as the requirements touched only those persons who sold milk within the city. Another contention was that a State law, which related to peddlers, prevented the city from levying a license fee, the law providing that "Nothing contained in this act shall be deemed to impair or restrain the right of any incorporated city or town to enact and enforce reasonable regulations without imposing licensing fees, to require purity and wholesomeness in milk and other foods." However, the supreme court held that the quoted sentence was a nullity because not germane to the title of the act and thus in contravention of the State constitution. Regarding the license fee prescribed by the ordinance, the court stated:

> Such license fee is not levied for peddling. It is not provided for revenue primarily. It is a reasonable provision for the proper inspection and regulation of the sale of milk within the city Those who are selling milk are required to register and pay a license, not because they are selling as peddlers, but to insure the proper regulation for the protection of the inhabitants of the city.

A third contention, against which the court also decided, was that the ordinance was void because it conferred arbitrary and unregulated power upon the health officer. In concluding its opinion, the court said:

> It follows that the ordinance attacked * * * is a valid exercise of the police power of the city of Portland Plaintiffs have not complied with the valid provisions contained in the ordinance. The decision sustaining the demurrer and dismissing the bill is correct, and the decree of the circuit court is therefore affirmed.

Operation of swimming pool enjoined to prevent pollution of city water supply.—(Texas Court of Civil Appeals; Newton et al. *v.* City of Groesbeck, 299 S. W. 518; decided October 6, 1927.) For the purpose of preserving the purity of its water supply, a city brought suit to enjoin the operation of a commercial swimming pool and bathhouse, which was so located that its use would have contaminated the city supply. There was a statutory provision to the effect that no one had a right to pollute any water course or other public body

of water which was being used for drinking and domestic purposes. The trial court granted an injunction restraining the operation of the swimming pool and bathhouse, and on appeal the judgment of said court was affirmed by the court of civil appeals.

Recovery denied licensed scavenger for cleaning of privy vaults.—(Minnesota Supreme Court; Meinke *v.* Jannette, 216 N. W. 534; decided November 25, 1927.) The plaintiff, a licensed scavenger, brought an action to recover a certain amount for cleaning several privy vaults owned by defendant. The plaintiff had no agreement with the defendant for said cleaning, and the defendant did not consent to the doing of the work. Also no notice in writing to clean the vaults had been given to the defendant by the city health department as provided by city ordinance. The supreme court, in deciding against the plaintiff, held that the said written notice was essential.

PUBLIC HEALTH ENGINEERING ABSTRACTS

The Milk and Dairies Order, 1926. F. A. Belam. *Public Health* (British), vol. 4, No. 12, September, 1927, pp. 395–397. (Abstract by H. V. Pedersen.)

This article is a critical discussion of the 1926 milk and dairies order of England. Doctor Belam points out the good features of the order and also calls attention to a number of clauses, the meaning of which is not clear. The author openly challenges the probability of enforcing the order as it relates to proper washing of udders, flanks, etc., and preventing the use of milkers suffering from infectious diseases.

The author closes his discussion by outlining four definite recommendations for the purpose of arousing further discussion and which might also be useful to the Ministry of Health in amending the order. Although it is difficult for a reader unfamiliar with the order to follow the discussion, the four recommendations are quoted as follows:

1. It should be specified clearly to what sanitary requirements the 18 months' notice applies, and made clear that this notice is needed only when requirements justify it.

2. The particulars of registration should be clarified as to who must register, etc., and should define dairy to include milk shops; also dairyman should be defined. All farmers producing milk for sale should be registered, and no loophole of escape should be given.

Local authorities should be empowered to refuse registration for unsuitable premises, and if refused, sale of milk should be prohibited until registration is granted.

3. Model regulations specifying in detail as to air space, lighting and ventilation, drainage channels, flooring (impervious), walls (impervious covering), etc., should be immediately drafted so that farmers in all areas would have exactly the same requirements to carry out. It should be clearly stated that inlet and outlet ventilators to the open air are needed, and clear definitions of all sanitary desiderata should be included. This would remove the justifiable complaint of different standards in different areas, and would materially assist enforcement of regulations in courts of law by eliminating phrases such as "adequate lighting" or "suitably ventilated," which have no real meaning at all.

Included in these should also be insistence on removal of manure before each milking; the hanging up of milking stools and the cooling of all milk at the farm should be demanded. The provision of a dairy should also be insisted upon.

4. In the case of farms not owned by the farmer, both tenant and landlord should be served with any notice. At present it is legal only to call upon the tenant farmer to carry out alterations, which is very hard upon those with yearly leases, or whose landlord invariably refuses to cooperate. Dual service of notice would make the landlord also liable in law, and then an agreement between him and his tenant farmer could be arrived at.

Pasteurization of Milk for Small Communities. B. Evan Parry. Publication No. 36, Department of Health, Canada, 1926. 83 pages. (Abstract by P. R. Carter)

This publication gives a more or less detailed discussion of raw and Pasteurized milk in their relation to the public health.

The various phases of the production and handling of raw milk are given. These include a discussion of the more common defects and methods of overcoming them and certain illustrations. Plans of dairy barns are appended.

The article describes the steps taken in the Pasteurization of milk. Various types of equipment, such as clarifiers, Pasteurizers, coolers, pumps, bottle fillers and cappers, and bottle washers are described and illustrated. Typical Pasteurization plant arrangements are also illustrated. A copy of the United States Public Health Service standard milk ordinance is appended

In conclusion the article states: "The relation between an unclean and infected milk supply and infant mortality is becoming more and more obvious. The decline in the so-called infectious diarrheas of infancy in our large cities, coinciding with more universal Pasteurization of milk, is clinical evidence in favor of this relationship. The residual incidence of these diseases may be ascribed to imperfect Pasteurization, improper care of milk before and after Pasteurization, and perhaps more especially to ignorance and carelessness of those who have to do with the handling of the milk in the home. No matter how carefully the production and transportation of milk may have been supervised; no matter how wholesome it may have been when left on the doorstep, the use of dirty hands and unclean utensils and failure to keep properly cooled may allow a lethal infection to enter between that stage and the infant's stomach."

Use of Hypochlorites as a Sterilizing Agent for Dairy Utensils. W. A. Hoy and Janet R. L. Rennie. *Journal of Hygiene* (British), vol. 26, No. 2, July, 1927, pp. 127–131. (Abstract by P. R. Carter)

Since disinfectants containing hypochlorites have been used for the sterilization of dairy utensils, and it has been claimed that such disinfectants are more effective than steam sterilization, this question was studied in the interests of the milk industry. Three proprietary disinfectants were studied. These contained "available chlorine" as follows: A—1.22 per cent; B—1.06 per cent; C—0.49 per cent.

Four series of experiments were conducted on milk churns of 10 and 17 gallons capacity, and the influence of different methods of treatment of the churns on the keeping qualities of milk and on the bacteriological condition of the churns was studied. The technique used in performing the experiments is given and the results are tabulated in the form of protocols.

The authors give their conclusions as follows: (1) The amount of "available chlorine" contained in these disinfectants varied from 1.23 per cent in disinfectant A to 0.49 per cent in disinfectant C; (2) a 6 per cent solution of disinfectant A failed to give the same degree of sterility in a churn as can be obtained by steam under working conditions; (3) the use of a chlorine preparation as a means of sterilizing churns necessitates the subsequent washing out of the churns with

water if the chlorine is to be removed before milk is added. This process introduces the danger of recontamination of the churn; (4) if the churn be not washed out after treatment with a chlorine preparation, there is grave danger that chlorine will be added to the milk. That this danger is not altogether hypothetical would appear to be the case, since in the United States where this method of sterilization is more extensively used than in this country, the Department of Agriculture has issued a bulletin describing a method for the detection of hypochlorites and chloramines in milk and cream. (U. S. Department of Agriculture Bulletin No. 1114, August, 1922.)

Mobile Milk Laboratory. Paul F. Krueger. *Illinois Health News*, vol. 13, No. 9, September, 1927, pp. 287-291. (Abstract by H. D. Cashmore.)

The Illinois Pasteurization law of 1925 made provisions for a mobile milk laboratory. After careful investigation and study as to its type, a very efficient laboratory was built which is now available for use in that State.

Visits will be made to the 352 plants located in 153 towns, and tests made of the quality of raw milk received, efficiency of the Pasteurization plant, and quality of milk distributed to consumers. The tests will include temperature, acidity, sediment, and bacterial content of milk at the different stages of the process, and, in addition, tests of the cleansing solutions and wash water. The field personnel consists of three men.

The laboratory is carried in a 21 passenger truck of the street-car type. A central aisle of full length, a 12 foot and a 9-foot bench with ample cabinet and drawer space, and a white enamel sink are built in. Water is furnished from a 24-gallon underslung pressure tank, electricity from a dual wiring system, and gas from presto-lite tanks. The sterilizers are heated by gasoline stoves, and the incubator and milk grader by electricity or gas.

It is possible for two cots to be placed in the aisle for sleeping in case of necessity, and heat is obtained from two exhaust heaters or 110-volt electric heaters.

Viability of Pathogenic Organisms in Butter. A. E. Berry. *Journal of Preventive Medicine*, vol. 1, No. 6, July, 1927, pp. 429 442. (Abstract by C. T. Butterfield.)

The author has determined the longevity of a number of pathogens in butter. The organisms and the numbers of days each was found to survive, follow: *A. aertrycke*, 273 days; *B. schottmulleri*, 293 days; *B. enteritidis*, 272 days; *B. typhosus* (Mississippi), 56 days; *B. typhosus* (Talladega), 292 days; *B. paratyphosus* A, 104 days; *B. suipestifer*, 73 days; *B. dysenteriae* (Flexner), 84 days; and *Streptococcus scarlatina*, 41 days. At no time was an increase observed.

The less resistant organisms decreased rapidly at the start; others showed a more gradual decline in numbers. The temperature of storage did not seem to affect markedly the rate until the butter became rancid; this destroyed all organisms rapidly.

The author also gives results with water and milk, reviews the literature of the subject, and gives a detailed description of his methods, procedure, and results.

On a basis of these results, butter must be considered a potential factor in the spread of communicable diseases.

Food Poisoning. Anon. *The Lancet* (No. 17 of vol. 2, 1927), No. 5434, vol. 213, October 22, 1927, p. 900. (Abstract by W. L. Havens.)

This article contains excerpts from a lecture delivered at the B. M. A. House, Tavistock Square, when Dr. W. G. Savage dealt with the subject of food poisoning.

On account of the necessity for conserving food supplies for long periods of time and the public demand for foods prepared in different ways, the problem of food poisoning has become an important item of public health work. Food

poisoning may be traceable to many different sources. Illness may be caused by a definitely poisoned plant or animal being consumed, as in the case of mushroom poisoning. Other sources include chemical poisoning from substances accidentally introduced into foods and bacteria developing in diseased meats and decomposed foods. These bacteria are frequently found in man-handled foods and even in foods which have been heated; they may be introduced accidentally during the subsequent cooling process.

Among the methods mentioned for preventing food poisoning may be included: (1) More rigid meat inspection; (2) sterilization of foods; (3) prevention of dust infection; (4) promotion of general cleanliness wherever foods are prepared or handled; (5) rat and mice extermination; (6) registration of all premises preparing and manufacturing made-up foods.

Another Milk-Borne Typhoid Epidemic. George D. Heath. *Illinois Health News*, vol. 13, No. 9, September, 1927, p. 281–284. (Abstract by H. D. Cashmore.)

A dairyman at Ullin had some sickness in his family prior to July 1, none of which could be definitely diagnosed as typhoid. However, the family of a neighbor did the work at the dairy and handled all the milk. There was sickness in this family prior to or about June 1, which was definitely proved to be typhoid fever and not malaria as had at first been thought. Evidently the neighbor's wife was an active carrier and handled the milk.

As a result of this condition there were found 8 cases of typhoid fever in Cairo, 5 in Mounds, and 1 case in Ullin among people who were known to use the raw milk from above-mentioned dairy which was being delivered to these towns. No new cases were reported after stopping the sale of milk from this dairy.

This situation indicates that there was some carelessness in regard to the handling of the milk from the dairy; and such cases point out the necessity for a law regulating the examination of food handlers.

Use of a Differential Stain in the Direct Enumeration of Bacteria in Pasteurized Milk. Margaret Beattie. *American Journal of Public Health*, vol. 17 No. 10, October, 1927, pp. 1031–1034. (Abstract by C. T. Butterfield.)

The literature dealing with the direct counting of bacteria in milk is briefly reviewed. A method of making direct counts of bacteria is given which differentiates between the living and the dead bacteria as well as gives the total count of both groups. A modification of Proca's methylene blue-fuchsin stain is employed.

The author concludes that in a comparison of plate counts of 31 samples of Pasteurized milk with direct counts, the latter vary less among themselves. There is a positive correlation between the two methods.

Raw Water Chlorination Experiments at Sandusky. O. F. Schoepfle. Sixth Annual Report of Ohio Conference on Water Purification, October, 1926, pp. 9–10. (Abstract by F. H. Waring.)

The increasing pollution of the raw water supply of Sandusky has taxed the purification plant to such extent that it has been impossible to produce an effluent, before chlorination, which is within the Treasury Department Standard.

The Sandusky water purification plant was reconstructed in 1914. It consists of 2 coagulating basins, 10 filters of 1 m. g. d. each, 2 clear wells, and equipment for coagulation of the water with a solution of aluminum sulphate and disinfection with liquid chlorine. The raw water intakes are two in number located in Sandusky Bay within 2,000 feet from shore.

Experiments were begun May, 1926, with prechlorination of the raw water to reduce the bacterial load on the water purification plant. A direct feed chlorinator was set up in an intake well in the raw water supply line about

500 feet ahead of the point of application of coagulant. Chlorine was applied at rates varying from 0.68 p. p. m. to 0.36 p. p. m., so that a residual chlorine of 0. 02 p. p. m. was present at the raw water suction well after a reaction period of about 10 minutes. Residual chlorine was entirely absent from the water when it reached the filters.

The number of bacteria in the raw water was reduced 70 per cent, and the number of *B. coli* was reduced 80 per cent before application of coagulant. Aside from its effect in bacteria removal, an improvement was noted in coagulation which permitted a saving of 20 per cent in coagulant. Also less trouble was experienced with algae. No satisfactory explanation for the improvement in the coagulation of prechlorinated water was arrived at.

In conclusion, it is stated that prechlorination of the raw water at Sandusky not only makes it possible to produce a filter effluent within the Treasury Department Standard, but effects a considerable saving in coagulant.

In general, the writer concludes that raw water chlorination can be advantageously employed in all water plants treating a highly polluted water where the products of chlorination are not offensive to taste and smell.

Description and Operating Results of the Girard Water-Softening Plant. Brooks D. Church. Sixth Annual Report of Ohio Conference on Water Purification, October, 1926, pp. 11–12. (Abstract by F. H. Waring.)

Girard is situated in Trumbull County north of the city of Youngstown. The water works was purchased by the city in 1922, and in 1925 a modern water-softening plant was constructed. The supply is obtained from an abandoned coal mine at a depth of 160 feet. The water is hard and has a high iron content. Consumption is about 400,000 g. p. d.

The softening plant consists of mechanical mixing chambers, settling basins, recarbonation chambers, two filters of one-half m. g. d. capacity each, a clear well of 93,000 gallons capacity, and two elevated storage tanks of 512,000 gallons total capacity. Chemical equipment consists in dry feed machines for application of lime and a carbon dioxide generating plant. The mixing chambers are four in number, 7 feet square in plan, and 14 feet deep. The retention period is 30 minutes. The tanks are provided with horizontal paddles which are rotated at the rate of 3 r. p. m. The settling basins have a retention period of three and one-half hours, and the outlet of each is over a skimming wall into the recarbonation chambers. These are 9 feet 3 inches by 10 feet 9 inches in plan and 12 feet 6 inches deep above the distribution grids. The grids in each chamber are perforated with 64⅛-inch openings spaced 14 inches one way and 16 inches the other way.

The carbon dioxide gas plant consists of a crusher for coal, a magnetic separator to remove foreign particles of iron, a feeder to the pulverizer, a combined pulveriser and blower which delivers coal to the furnace where it is turned to complete products of combustion. A scrubber and drier are provided and a motor-driven centrifugal water piston pump discharging into a receiver which is connected to the distributing grids. This plant will produce 21 pounds of CO_2 per hour.

Floats are provided in the clear well which actuate automatic starts and stops on the low service pumps. High service pumps are also automatically controlled by automatic devices actuated by a pressure regulator.

The quality of the supply is such that no disinfection is required. Bacterial analyses are made daily by the chemist in charge. Chemical analyses indicate

that by the application of 10 g. p. g. of lime (as CaO) the hardness is reduced from 192 p. p. m. to 90 p. p. m. Recarbonation removes all the carbonates and an excess of about 2 p. p. m. of CO_2 is present in the filtered water.

Combination of Excess Lime, Double Coagulation, and Adjustment of pH Value at Ironton. E. T. Edwards. Sixth Annual Report of Ohio Conference on Water Purification, October, 1926, p. 9. (Abstract by F. H. Waring.)

On account of the high bacterial content of the water in Ohio River from which the Ironton public water supply is obtained, double coagulation followed by filtration and disinfection has been practiced for several years. Prechlorination of the raw water was tried in 1925, but was discontinued on account of the disagreeable tastes produced, due to the presence of phenols in the water.

Excess lime treatment of the raw water was therefore tried in an effort to render the water safe without having to depend on chlorine disinfection. Lime was applied at the rate of 2 to 3 g. p. g. in the primary settling basin. A causticity of about 5 p. p. m. was obtained. Treatment was later increased to produce a causticity of about 20 p. p. m. Alum was applied in the mixing chamber preceding the secondary settling basin for the double purpose of removing the turbidity and lowering the pH value of the caustic water so that no incrustation of the sand would take place. The amount of alum required to produce a water free from carbonates was excessive, and experiments were conducted in the application of CO_2 to the lime-treated water. A machine called a "Ceco spray" was tried out. Its function was to absorb CO_2 from the gas given off by burning coke in the heating furnace. The results of these experiments proved that an insufficient amount of CO_2 could be absorbed by this machine and preparations are now being made to install a regular CO_2 generating plant consisting of the furnace, a scrubber, a drier, a compressor, and a distributing grid which will be located in the mixing chamber. Bacterial results have been fairly satisfactory. By excess lime treatment in the primary basin the *B. coli* index has been reduced from about 30,000 to 100 per 100 c. c. Even better results are hoped for when this method of treatment is continuous. No incrustation of the sand in the filters is taking place. The filters have become a true factor of safety and chlorine may be dispensed with at will. A saving in coagulant is effected when excess lime treatment is followed by recarbonation with CO_2 gas.

DEATHS DURING WEEK ENDED JANUARY 21, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended January 21, 1928 and corresponding week of 1927. (From the Weekly Health Index, January 25, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Jan 21, 1928	Corresponding week 1927
Policies in force	69, 723, 381	66, 588, 121
Number of death claims	14, 287	13, 298
Death claims per 1,000 policies in force, annual rate	10. 7	10. 4

Deaths from all causes in certain large cities of the United States during the week ended January 21, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, January 25, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Jan. 21, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Jan. 21, 1928 [2]
	Total deaths	Death rate [1]		Week ended Jan. 21, 1928	Corresponding week 1927	
Total (68 cities)	7,836	13.4	14.0	763	865	62
Akron	39			4	9	43
Albany [5]	47	20.4	14.8	3	7	61
Atlanta	84	17.3	18.2	14	11	
White	50		16.7	7	5	
Colored	34	(6)	21.9	7	6	
Baltimore [5]	253	15.9	17.5	29	37	92
White	201		15.8	19	25	76
Colored	52	(6)	27.7	10	12	157
Birmingham	89	20.9	15.6	11	15	94
White	46		10.2	5	4	69
Colored	43	(6)	24.0	6	11	135
Boston	254	16.6	16.1	27	32	75
Bridgeport	34			3	3	55
Buffalo	147	13.8	16.0	16	19	69
Cambridge	31	12.9	11.4	4	2	71
Camden	36	13.9	9.8	5	5	80
Canton	25	11.2	12.4	5	5	119
Chicago [5]	680	11.3	12.9	68	90	58
Cincinnati	133	16.8	18.7	9	10	54
Cleveland	196	10.2	10.6	20	19	54
Columbus	88	15.5	16.8	9	6	84
Dallas	55	13.2	10.6	4	6	
White	41		9.6	3	4	
Colored	14	(6)	17.1	1	2	
Denver	114	20.3	16.0	9	9	
Des Moines	36	12.4	13.0	6	0	100
Detroit	274	10.4	11.0	38	56	59
Duluth	26	11.6	8.2	2	0	47
El Paso	38	16.9	13.8	7	6	
Erie	27			[illegible]	4	103
Fall River [5]	24	9.3	7.1	5	5	86
Flint	18	6.3	7.3	4	3	51
Fort Worth	30	9.3	7.3	2	0	
White	21		6.9	2	0	
Colored	9	(6)	10.6	0	0	
Grand Rapids	29	9.2	14.2	5	3	75
Houston	67			6	8	
White	49			4	5	
Colored	18	(6)		2	3	
Indianapolis	112	15.3	14.9	7	12	53
White	100		14.6	7	12	61
Colored	12	(6)	17.5	0	0	0
Jersey City	93	15.0	9.6	10	4	75
Kansas City, Kans	30	13.3	8.4	1	3	21
White	24		7.6	0	3	0
Colored	6	(6)	12.3	1	0	145
Kansas City, Mo	111	14.8	13.3	6	7	42
Knoxville	38	18.9	23.0	5	4	109
White	30		19.1	5	2	121
Colored	8	(6)	51.3	0	2	0
Los Angeles	276			25	23	72
Louisville	86	13.7	16.1	11	10	92
White	57		13.8	8	7	76
Colored	29	(6)	28.8	3	3	207
Lowell	20	9.5	11.3	2	4	42
Lynn	23	11.4	10.9	3	1	76
Memphis	77	22.2	21.9	3	8	35
White	32		16.3	1	3	19
Colored	45	(6)	32.1	2	5	63
Milwaukee	110	10.6	11.0	12	21	54
Minneapolis	96	11.0	12.0	12	3	72
Nashville	52	19.6	22.3	4	3	63
White	32		20.0	2	2	43
Colored	20	(6)	28.1	2	1	120
New Bedford	32	14.0	15.3	5	6	108
New Haven	36	10.0	13.0	1	2	14

See footnotes on p. 278.

Deaths from all causes in certain large cities of the United States during the week ended January 21, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927—Continued

City	Week ended Jan. 21, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Jan. 21, 1928 [2]
	Total deaths	Death rate [1]		Week ended Jan. 21, 1928	Corresponding week 1927	
New Orleans	185	22.5	23.2	7	19	34
White	111		19.6	4	5	29
Colored	74	(6)	33.6	3	14	44
New York	1,570	13.6	14.1	177	136	71
Bronx Borough	196	10.8	10.8	14	7	42
Brooklyn Borough	531	12.0	11.9	65	55	65
Manhattan Borough	641	19.1	20.2	83	55	98
Queens Borough	155	9.5	10.1	11	14	44
Richmond Borough	47	16.3	15.3	4	5	72
Newark, N. J.	99	10.9	11.5	9	9	46
Oakland	65	12.4	11.9	5	5	54
Oklahoma City	36			5	4	
Omaha	62	14.5	10.2	4	1	46
Paterson	36	13.0	14.9	2	2	35
Philadelphia	516	13.1	15.7	40	73	54
Pittsburgh	174	13.5	17.9	14	31	46
Portland, Oreg	59			2	6	21
Providence	75	13.7	13.8	5	10	44
Richmond	48	12.9	17.7	6	10	78
White	31		14.5	5	4	101
Colored	17	(6)	25.3	1	6	37
Rochester	82	13.1	11.2	8	10	65
St. Louis	260	16.0	13.4	19	20	64
St. Paul	63	13.1	10.4	8	5	77
Salt Lake City [5]	32	12.1	12.7	0	4	0
San Antonio	65	15.6	14.8	12	9	
San Diego	46	20.1	21.7	3	2	57
San Francisco	168	15.0	15.8	7	15	44
Schenectady	23	12.9	15.7	4	1	125
Seattle	73	10.0	9.3	5	3	51
Somerville	20	10.2	11.8	4	2	138
Spokane	20	9.6	9.1	1	4	26
Springfield, Mass.	36	12.6	11.7	1	3	16
Syracuse	38	10.0	12.7	2	5	24
Tacoma	27	12.8	12.2	3	0	77
Toledo	79	13.2	14.3	5	10	48
Trenton	31	11.7	14.9	3	7	51
Washington, D. C.	162	15.3	17.3	16	15	91
White	90		16.3	6	8	50
Colored	72	(6)	20.3	10	7	185
Waterbury	18			2	3	58
Wilmington, Del.	37	15.1	12.8	4	5	105
Worcester	54	14.3	11.7	0	2	0
Yonkers	23	9.9	11.4	1	5	23
Youngstown	44	13.2	10.2	4	8	53

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[5] Deaths for week ended Friday, Jan. 20, 1928.
[6] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 29, 1927, and January 28, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 29, 1927, and January 28, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928
New England States:								
Maine	2	3	21	4	185	75	0	0
New Hampshire		3		17		68		0
Vermont	2	1			94	24	0	0
Massachusetts	108	115	27	11	170	1,319	1	3
Rhode Island	7	16		11	1	1	0	0
Connecticut	29	46	31	7	48	164	0	0
Middle Atlantic States:								
New York	380	436	[1] 169	[1] 33	743	1,081	7	8
New Jersey	115	185	40	13	28	269	3	1
Pennsylvania	225	232			785	822	3	2
East North Central States:								
Ohio		221		16		291		5
Indiana	52	45	73	22	143	132	1	0
Illinois	114	178	53	21	1,575	61	3	5
Michigan	135	77		5	136	404	0	6
Wisconsin	41	42	51	86	710	48	8	5
West North Central States:								
Minnesota	41	27	2	3	328	3	6	4
Iowa [2]	28	32			163	86	0	1
Missouri	50	48	9	9	240	57	0	3
North Dakota	8	6			111	26	1	1
South Dakota		4		2	116	15	0	0
Nebraska	10	19	27	17	151	6	1	0
Kansas	19	33	9	5	262	21	0	1
South Atlantic States:								
Delaware	4	7	1	1	2	10	1	0
Maryland [2]	63	30	115	47	26	365	0	0
District of Columbia	24	34	1	9	1	20	0	0
Virginia								
West Virginia	20	20	65	22	120	79	1	1
North Carolina	41	53			162	4,056	0	1
South Carolina	17	27	1,299	1,083	90	1,126	0	0
Georgia	11	14	159	231	107	251	2	1
Florida	56	14	45	20	32	13	0	0

[1] New York City only.

[2] Week ended Friday.

Reports for Weeks Ended January 29, 1927, and January 28, 1928—Continued

Cases of certain communicable disease reported by telegraph by State health officers for weeks ended January 29, 1927, and January 28, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928
East South Central States:								
Kentucky		15		21		141		0
Tennessee	15	17	147	147	180	495	0	1
Alabama	37	47	91	275	79	332	0	3
Mississippi	16	25						
West South Central States:								
Arkansas	12	15	100	144		254	1	0
Louisiana	17	27	53	65	88	83	2	1
Oklahoma [3]	27	49	297	194	94	111	0	1
Texas	51	39	248	127	17	21	1	0
Mountain States:								
Montana	9	9			174		0	5
Idaho	1				130		0	0
Wyoming	7	3			276	8	4	0
Colorado	2	19	1		76	139	1	8
New Mexico	2		8		22	115	0	0
Arizona	1	2	2		16	8	0	3
Utah [3]	4	6	2	5	270	1	0	1
Nevada								
Pacific States:								
Washington	40	15		2	210	198	9	1
Oregon	10	7	111	32	75	21	6	1
California	148	155	44	40	1,731	100	7	2

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928	Week ended Jan. 29, 1927	Week ended Jan. 28, 1928
New England States:								
Maine	0	0	44	23	0	0	1	5
New Hampshire		0		18		0		0
Vermont	0	0	8	17	0	0	0	0
Massachusetts	1	1	798	333	0	0	4	10
Rhode Island	0	0	20	45	0	0	1	1
Connecticut	1	1	104	124	0	15	6	1
Middle Atlantic States:								
New York	2	7	800	723	10	5	19	25
New Jersey	0	1	387	262	0	1	1	9
Pennsylvania	1	2	555	580	0	0	15	14
East North Central States:								
Ohio		0		347		21		15
Indiana	0	4	235	127	158	93	5	3
Illinois	0	4	365	358	57	38	9	11
Michigan	0	1	303	275	44	26	4	6
Wisconsin	3	0	198	187	17	35	2	1
West North Central States:								
Minnesota	0	0	284	170	6	2	2	3
Iowa [3]	0	0	28	81	13	75	0	2
Missouri	0	2	161	93	21	42	1	1
North Dakota	0	1	60	32	11	2	0	3
South Dakota	0	0	63	54	12	1	0	0
Nebraska	0	0	99	97	21	68	0	3
Kansas	1	0	201	180	59	106	2	4
South Atlantic States:								
Delaware	0	0	44	3	0	0	0	0
Maryland [3]	0	0	96	66	1	1	6	6
District of Columbia	0	0	32	39	0	0	0	2
Virginia	0				10			
West Virginia	0	2	65	68	13	37	19	4
North Carolina	2	0	65	70	47	117	2	0
South Carolina	4	4	7	21	24	10	7	9
Georgia	0	0	29	15	108	0	6	7
Florida	2	0	25	13	59	1	27	12

[3] Week ended Friday.

Reports for Weeks Ended January 29, 1927, and January 28, 1928—Continued

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended January 29, 1927, and January 28, 1928—Continued

Division and State	Poliomyelitis: Week ended Jan. 29, 1927	Poliomyelitis: Week ended Jan. 28, 1928	Scarlet fever: Week ended Jan. 29, 1927	Scarlet fever: Week ended Jan. 28, 1928	Smallpox: Week ended Jan. 29, 1927	Smallpox: Week ended Jan. 28, 1928	Typhoid fever: Week ended Jan. 29, 1927	Typhoid fever: Week ended Jan. 28, 1928
East South Central States:								
Kentucky		0		48		41		3
Tennessee	0	1	45	28	4	35	15	7
Alabama	0	0	34	24	97	11	10	19
Mississippi	0	0	12	12	15	22	4	8
West South Central States:								
Arkansas	0	2	7	12	3	18	7	10
Louisiana	0	0	20	10	7	17	14	8
Oklahoma [3]	2	2	48	52	25	150	0	11
Texas	0	3	40	58	73	41	4	22
Mountain States:								
Montana	0	0	143	22	1	20	2	1
Idaho	0	0	15	6	5	13	1	0
Wyoming	0	0	38	36	0	4	0	0
Colorado	1	2	97	146	24	18	2	3
New Mexico	0	0	38	11	0	1	0	3
Arizona	0	1	6	2	0	8	0	0
Utah [2]	0	0	15	11	1	19	0	1
Nevada								
Pacific States:								
Washington	0	1	95	66	61	46	4	4
Oregon	0	5	52	18	52	51	5	2
California	5	4	284	226	23	27	10	6

[2] Week ended Friday. [3] Exclusive of Tulsa.

Reports for Week Ended January 21, 1928

	Cases
DIPHTHERIA	
District of Columbia	32
Georgia	12
Iowa [2]	9
INFLUENZA	
District of Columbia	1
Georgia	190
MEASLES	
District of Columbia	5
Georgia	65
Iowa [2]	76
MENINGOCOCCUS MENINGITIS	
Iowa [2]	1
SCARLET FEVER	
District of Columbia	29
Georgia	19
Iowa [2]	92
New Hampshire	34
SMALLPOX	
Iowa [2]	73
TYPHOID FEVER	
Georgia	9
Iowa [2]	1

[2] Week ended Friday.

Reports for Week Ended January 14, 1928

	Cases
DIPHTHERIA	
Iowa [2]	12
Ohio	195
INFLUENZA	
Ohio	53
MEASLES	
Iowa [2]	82
Ohio	176
MENINGOCOCCUS MENINGITIS	
Iowa [2]	3
POLIOMYELITIS	
Iowa [2]	3
Ohio	5
SCARLET FEVER	
Iowa [2]	84
Ohio	295
SMALLPOX	
Iowa [2]	109
Ohio	23
TYPHOID FEVER	
Iowa [2]	1
Ohio	14

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December, 1927										
Alabama	2	335	479	112	425	32	6	132	18	73
Arkansas	0	81	351	109	92	82	3	51	13	25
District of Columbia	1	63	6		11	1	0	135	0	2
Illinois	32	844	161	28	124		14	1,229	100	69
Iowa	3	78			51		14	309	261	12
Louisiana	2	148	99	72	168	17	1	56	27	34
Maine	0	41	135		221	1	9	207	0	28
Maryland	2	168	107	2	404	0	3	133	0	49
Michigan	0	457	17	1	1,216	1	16	1,011	144	57
Minnesota	7	171	5		17		7	564	7	18
Mississippi		185	4,239	2,715	2,260	313	6	128	16	64
Missouri	14	332	32	39	105		7	508	190	41
New Hampshire	0	6	135				2	49	0	8
New York	13	1,637		6	1,786		26	1,911	23	98
Oklahoma [1]	7	309	497	134	318	7	5	205	328	116
Pennsylvania	17	1,303			3,129		20	2,073	3	108
Rhode Island	0	106	23		34		3	164	0	2
West Virginia	1	117	107		244	0	13	298	127	126

[1] Exclusive of Oklahoma City and Tulsa.

December, 1927	Cases
Actinomycosis:	
Illinois	1
Anthrax:	
Pennsylvania	2
Chicken pox:	
Alabama	142
Arkansas	99
District of Columbia	107
Illinois	1,477
Iowa	206
Louisiana	19
Maine	227
Maryland	507
Michigan	786
Minnesota	560
Mississippi	656
Missouri	500
New York	2,250
Oklahoma [1]	95
Pennsylvania	3,301
Rhode Island	38
West Virginia	217
Dengue:	
Mississippi	18
Dysentery:	
Illinois	28
Louisiana	1
Maryland	4
Mississippi (amoebic)	52
Mississippi (bacillary)	320
New York	9
Oklahoma [1]	8
German measles:	
Illinois	23
Iowa	5
Maine	3
Maryland	6
New York	109

German measles—Continued.	Cases
Pennsylvania	81
Rhode Island	2
Hookworm disease:	
Arkansas	1
Louisiana	10
Mississippi	231
Impetigo contagiosa:	
Maryland	1
Lead poisoning:	
Illinois	15
Pennsylvania	1
Lethargic encephalitis:	
Alabama	4
Illinois	10
Louisiana	1
Maryland	3
Michigan	2
Minnesota	3
New York	21
Pennsylvania	7
Malta fever:	
Illinois	5
Iowa	2
Mumps:	
Alabama	123
Arkansas	93
Illinois	686
Iowa	98
Maine	126
Maryland	57
Michigan	658
Mississippi	555
Missouri	371
New York	1,437
Oklahoma [1]	16
Pennsylvania	1,903
Rhode Island	69

[1] Exclusive of Oklahoma City and Tulsa.

	Cases
Ophthalmia neonatorum:	
Illinois	34
Maryland	2
Mississippi	16
New York	3
Oklahoma [1]	2
Pennsylvania	21
Paratyphoid fever:	
Illinois	1
New York	2
Puerperal septicemia:	
Illinois	12
Mississippi	30
New York	4
Pennsylvania	14
Rabies in animals:	
Maryland	2
Mississippi	11
Missouri	4
New York	26
Rabies in man:	
Alabama	1
Illinois	1
Maine	1
Michigan	1
Pennsylvania	1
Septic sore throat:	
Illinois	4
Louisiana	1
Maryland	5
Michigan	31
Missouri	16
New York	10
Oklahoma [1]	11
Tetanus:	
Illinois	1
Louisiana	2
Maryland	2
Missouri	1
New York	1
Oklahoma [1]	5

	Cases
Tetanus—Continued.	
Pennsylvania	8
Rhode Island	2
Trachoma:	
Arkansas	92
Illinois	3
Maryland	1
Mississippi	6
Missouri	22
New York	3
Oklahoma [1]	22
Pennsylvania	1
Tularaemia:	
Alabama	1
Arkansas	1
Illinois	8
Louisiana	1
Typhus fever:	
Alabama	8
Vincent's angina:	
Maine	16
Maryland	6
New York	103
Oklahoma [1]	1
Whooping cough.	
Alabama	67
Arkansas	26
District of Columbia	29
Illinois	820
Iowa	32
Louisiana	30
Maine	103
Maryland	110
Michigan	446
Minnesota	25
Mississippi	1,170
Missouri	138
New York	1,790
Oklahoma [1]	27
Pennsylvania	873
Rhode Island	7
West Virginia	81

RECIPROCAL NOTIFICATIONS

Notifications regarding communicable diseases sent during the month of December, 1927, by departments of health of certain States to other State health departments

Referred by—	Chicken pox	Diphtheria	Measles	Poliomyelitis	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever
California				1				
Illinois		[1] 1				5	[2] 1	3
Massachusetts								1
Minnesota						1	12	1
New York	1	[1] 3	1		1			2
Ohio							[3] 1	

[1] One carrier. [2] Arrested case. [3] Pulmonary.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 100 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,100,000. The estimated population of the 94 cities reporting deaths is more than 30,400,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended January 14, 1928, and January 15, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
41 States	2,295	2,069	
100 cities	1,186	1,094	1,121
Measles:			
40 States	11,337	8,489	
100 cities	2,941	2,018	
Poliomyelitis:			
41 States	65	18	
Scarlet fever:			
41 States	4,434	5,411	
100 cities	1,537	2,165	1,372
Smallpox			
41 States	1,285	1,259	
100 cities	139	133	95
Typhoid fever:			
41 States	194	285	
100 cities	47	56	46
Deaths reported			
Influenza and pneumonia:			
94 cities	1,253	1,147	
Smallpox:			
94 cities	0	0	

City reports for week ended January 14, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
NEW ENGLAND									
Maine:									
Portland	76,400	16	2	0	0	0	3	3	2
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	1	0	2
Manchester	84,000	0	2	0	0	1	0	0	0

City reports for week ended January 14, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND—con.									
Vermont:									
Barre	[1] 10,008	7	0	0	0	0	0	0	1
Burlington	[1] 24,089	1	0	0	0	0	0	1	0
Massachusetts:									
Boston	787,000	98	57	26	4	0	336	11	31
Fall River	131,000	2	6	7	1	0	0	0	5
Springfield	145,000	14	4	20	0	0	3	33	1
Worcester	193,000	43	6	3	0	0	0	99	0
Rhode Island:									
Pawtucket	71,000	8	1	2	0	0	0	2	3
Providence	275,000	0	10	12	0	0	1	16	10
Connecticut:									
Bridgeport	(2)	5	8	7	1	0	0	0	0
Hartford	164,000	24	8	9	0	0	1	7	15
New Haven	182,000	24	3	1	0	3	99	42	8
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000		16	---	---	---	---	---	---
New York	5,924,000	185	210	335	22	24	158	34	286
Rochester	321,000	9	13	6	---	0	4	5	8
Syracuse	185,000	34	6	2	---	0	62	9	1
New Jersey:									
Camden	131,000	2	5	18	1	0	0	4	2
Newark	459,000	54	17	27	2	1	65	33	20
Trenton	134,000	0	5	3	0	0	3	3	2
Pennsylvania:									
Philadelphia	2,008,000	161	85	65	---	10	40	123	71
Pittsburgh	637,000	29	21	33	---	6	207	102	28
Reading	114,000	25	5	5	---	0	0	3	1
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	41	12	16	1	5	161	2	27
Cleveland	960,000	102	36	85	3	1	31	159	19
Columbus	285,000	12	6	8	2	2	3	14	9
Toledo	295,000	70	11	1	3	3	91	14	9
Indiana:									
Fort Wayne	99,900	3	4	7	0	0	0	0	6
Indianapolis	367,000	18	12	7	0	0	12	54	16
South Bend	81,700	1	1	2	0	0	2	0	2
Terre Haute	71,900	0	1	1	0	0	0	0	3
Illinois:									
Chicago	3,048,000	150	98	123	15	5	17	42	90
Springfield	64,700	6	1	0	0	0	1	11	0
Michigan:									
Detroit	1,290,000	78	71	58	12	2	198	79	44
Flint	136,000	16	8	7	0	0	3	108	3
Grand Rapids	156,000	11	4	0	0	2	27	9	2
Wisconsin:									
Kenosha	52,700	20	2	2	0	0	0	6	1
Madison	47,000	5	0	0	0	0	1	2	1
Milwaukee	517,000	105	22	18	3	3	3	51	17
Racine	69,400	12	2	3	0	0	1	1	1
Superior	[1] 39,671	12	1	0	0	0	0	0	2
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	0	3	2	0	0	0	0	5
Minneapolis	434,000	46	21	15	0	2	3	17	18
St. Paul	248,000	24	17	1	0	1	1	68	13
Iowa:									
Davenport	[1] 52,469	0	0	2	0	---	2	0	---
Des Moines	146,900	0	4	1	0	---	0	0	---
Sioux City	78,000	0	2	0	0	---	26	41	---
Waterloo	36,900	9	0	0	0	---	2	3	---

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended January 14, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
WEST NORTH CENTRAL—Cont.									
Missouri:									
Kansas City	375,000	43	10	2	1	4	2	84	12
St. Joseph	78,400	3	3	2	0	0	1	6	5
St. Louis	830,000	19	53	30	0	0	20	14	-------
North Dakota:									
Fargo	[1] 26,403	25	0	0	0	0	0	1	0
Grand Forks	[1] 14,811	2	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	[1] 15,036	2	0	0	0	-------	0	0	-------
Sioux Falls	[1] 30,127	0	1	0	0	-------	0	0	-------
Nebraska:									
Lincoln	62,000	28	2	1	0	0	0	20	0
Omaha	216,000	11	5	2	0	0	0	0	6
Kansas:									
Topeka	56,500	32	2	3	0	0	0	1	1
Wichita	92,500	10	4	0	0	0	1	0	0
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	10	3	0	0	0	0	10	4
Maryland:									
Baltimore	808,000	172	41	17	19	3	212	18	44
Cumberland	[1] 33,741	2	1	0	1	0	0	0	4
Frederick	[1] 12,035	4	1	1	0	0	0	0	0
District of Columbia:									
Washington	528,000	49	21	32	2	2	7	0	22
Virginia:									
Lynchburg	30,500	7	1	4	0	0	0	0	3
Norfolk	174,000	0	3	0	0	0	10	1	12
Richmond	189,000	10	7	4	0	0	31	0	6
Roanoke	61,900	6	1	6	0	0	6	1	1
West Virginia:									
Charleston	50,700	2	2	0	0	0	0	0	1
Wheeling	[1] 56,208	11	2	0	0	0	2	0	1
North Carolina:									
Raleigh	[1] 30,371	10	1	1	0	0	6	0	3
Wilmington	37,700	3	1	1	0	0	139	1	1
Winston-Salem	71,800	4	1	2	0	1	49	21	5
South Carolina:									
Charleston	74,100	4	2	0	56	1	0	0	6
Columbia	41,800	10	1	1	0	1	187	33	3
Greenville	[1] 27,311	1	0	0	0	0	129	13	5
Georgia:									
Atlanta	[2]	5	4	2	44	7	4	9	13
Brunswick	[1] 16,809	0	0	0	0	0	0	2	0
Savannah	94,900	5	2	3	14	6	69	1	4
Florida:									
Miami	[1] 69,754	7	-------	4	1	1	0	0	2
St. Petersburg	[1] 26,847	-------	0	-------	-------	0	-------	-------	1
Tampa	102,000	15	1	7	0	0	2	1	6
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	4	1	0	0	0	24	0	0
Lexington	47,500	1	-------	0	0	0	0	2	3
Louisville	311,000	10	7	2	2	0	17	8	10
Tennessee:									
Memphis	177,000	7	6	4	0	4	253	26	7
Nashville	137,000	3	2	1	0	4	10	4	10
Alabama:									
Birmingham	211,000	5	4	3	38	3	1	7	11
Mobile	66,800	0	1	0	0	4	0	0	5
Montgomery	47,000	1	0	0	2	-------	0	0	-------

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended January 14, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	7	1	0	0	------	1	0	------
Little Rock	75,900	1	1	0	1	1	32	0	5
Louisiana:									
New Orleans	419,000	6	13	11	13	9	4	0	24
Shreveport	59,500	6	2	3	0	2	14	0	5
Oklahoma:									
Oklahoma City	(2)	3	1	5	3	1	1	0	16
Tulsa	133,000	3	2	2	0	------	0	10	------
Texas:									
Dallas	203,000	27	8	13	1	0	4	0	8
Fort Worth	159,000	16	4	10	0	1	1	2	7
Galveston	49,100	0	1	0	0	0	0	0	1
Houston	[1] 164,954	4	6	20	1	2	7	2	12
San Antonio	205,000	0	2	4	0	2	5	1	15
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	0
Great Falls	[1] 29,883	0	0	0	0	1	1	0	0
Helena	[1] 12,037	0	0	0	0	0	0	1	1
Missoula	[1] 12,668	2	0	0	0	0	0	0	1
Idaho:									
Boise	[1] 23,042	8	0	0	0	0	0	4	0
Colorado:									
Denver	285,000	35	10	5	------	4	9	56	13
Pueblo	43,900	10	3	0	0	1	1	1	3
New Mexico:									
Albuquerque	[1] 21,000	6	0	1	0	0	18	0	2
Utah:									
Salt Lake City	133,000	31	3	5	0	1	0	2	1
Nevada:									
Reno	[1] 12,665	1	0	0	0	0	1	0	0
PACIFIC									
Washington:									
Seattle	(2)	25	5	5	0	------	168	12	------
Spokane	109,000	5	3	0	0	------	0	0	------
Tacoma	106,000	7	4	1	0	0	2	4	1
Oregon:									
Portland	[1] 282,383	55	11	8	1	5	8	4	15
California:									
Los Angeles	(2)	70	45	41	23	8	13	22	33
Sacramento	73,400	1	3	0	0	0	6	0	1
San Francisco	567,000	87	21	9	2	3	17	28	7

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	4	0	0	0	1	1	0	0	0	18
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	9
Manchester	2	0	0	0	0	0	0	0	0	0	8
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	3
Burlington	1	1	0	0	0	0	0	0	0	0	12

[1] Estimated July 1, 1925.
[2] No estimate made.

City reports for week ended January 14, 1928—**Continued**

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND—continued											
Massachusetts											
Boston	70	77	0	0	0	17	1	1	1	96	250
Fall River	3	14	0	0	0	1	1	1	0	0	32
Springfield	8	19	0	0	0	1	0	0	0	8	43
Worcester	12	8	0	0	0	5	0	1	0	15	47
Rhode Island											
Pawtucket	1	2	0	0	0	0	0	0	0	0	19
Providence	9	33	0	0	0	2	1	1	0	0	68
Connecticut											
Bridgeport	10	4	0	0	0	0	0	0	0	3	37
Hartford	9	8	0	0	0	2	0	2	0	7	51
New Haven	10	4	0	0	0	1	0	0	0	33	50
MIDDLE ATLANTIC											
New York											
Buffalo	25		1	...	...	...	0	...	...	...	...
New York	237	288	0	0	0	112	10	7	2	205	1,721
Rochester	15	4	0	0	0	2	1	0	0	1	67
Syracuse	13	19	0	0	0	2	1	0	0	28	45
New Jersey											
Camden	5	9	0	0	0	1	1	1	0	0	31
Newark	27	20	0	0	0	0	1	0	0	45	102
Trenton	5	5	0	0	0	4	0	0	0	1	37
Pennsylvania											
Philadelphia	97	110	0	0	0	28	3	2	0	65	531
Pittsburgh	40	33	0	0	0	11	1	1	0	5	204
Reading	2	31	0	0	0	2	0	0	0	2	25
EAST NORTH CENTRAL											
Ohio											
Cincinnati	20	21	1	1	0	7	0	0	0	0	155
Cleveland	45	48	1	0	0	14	1	4	1	54	197
Columbus	11	20	1	0	0	2	0	0	0	1	85
Toledo	16	10	1	0	0	4	1	0	0	1	68
Indiana											
Fort Wayne	6	6	1	0	0	0	0	0	0	2	30
Indianapolis	10	19	11	3	0	6	1	0	0	3	114
South Bend	4	2	1	0	0	0	0	0	0	0	10
Terre Haute	3	1	0	2	0	0	0	0	0	1	22
Illinois.											
Chicago	138	127	1	1	0	41	3	1	0	172	837
Springfield	2	11	0	0	0	0	0	0	0	2	22
Michigan.											
Detroit	90	86	3	3	0	13	1	0	0	66	285
Flint	10	25	0	1	0	1	0	0	0	12	26
Grand Rapids	13	9	0	0	0	1	0	0	0	4	25
Wisconsin:											
Kenosha	2	3	1	0	0	0	0	0	0	2	5
Madison	3	7	0	0	0	0	0	0	0	1	...
Milwaukee	31	43	2	0	0	12	1	0	0	15	128
Racine	7	10	1	0	0	1	0	0	0	12	14
Superior	3	5	1	0	0	1	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota.											
Duluth	10	4	0	0	0	2	0	0	0	1	33
Minneapolis	58	32	7	2	0	2	1	1	0	0	115
St. Paul	32	12	9	0	0	1	0	0	0	2	65
Iowa:											
Davenport	1	4	1	0	...	...	0	0	...	0	...
Des Moines	7	14	2	9	...	...	0	0	...	0	...
Sioux City	2	4	2	0	...	...	0	0	...	0	...
Waterloo	2	0	1	0	...	...	0	0	...	0	...
Missouri:											
Kansas City	14	15	3	3	0	6	0	0	0	1	109
St. Joseph	3	6	0	26	0	1	0	1	0	0	34
St. Louis	14	43	2	1	0	18	1	2	0	30	240

City reports for week ended January 14, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL—contd.											
North Dakota:											
Fargo	2	3	0	0	0	0	0	0	0	3	7
Grand Forks	0	0	0	0			0	0		0	
South Dakota:											
Aberdeen	1	0	0	0			0	0		0	
Sioux Falls	1	3	0	0			0	0		0	6
Nebraska:											
Lincoln	2	0	0	16	0	0	0	0	0	5	17
Omaha	4	6	8	1	0	2	0	0	0	0	60
Kansas:											
Topeka	3	2	0	1	0	0	0	0	0	4	11
Wichita	5	7	1	41	0	2	0	0	0	0	23
SOUTH ATLANTIC											
Delaware:											
Wilmington	6	2	0	0	0	0	0	0	0	0	36
Maryland:											
Baltimore	38	34	0	0	0	23	2	0	0	36	269
Cumberland	1	1	0	0	0	0	0	0	0	0	11
Frederick	0	0	0	0	0	0	0	0	0	0	2
District of Columbia:											
Washington	26	37	1	0	0	10	2	0	0	7	162
Virginia:											
Lynchburg	0	1	0	0	0	1	0	0	0	4	11
Norfolk	1	1	0	0	0	0	0	0	0	0	
Richmond	6	1	0	0	0	1	0	0	0	2	47
Roanoke	1	3	1	0	0	0	1	0	0	0	13
West Virginia:											
Charleston	1	0	0	0	0	1	0	0	1	0	13
Wheeling	3	1	0	0	0	3	1	0	0	0	15
North Carolina:											
Raleigh	0	1	1	7	0	0	0	0	0	0	19
Wilmington	1	1	0	0	0	1	0	0	0	0	12
Winston-Salem	1	2	3	0	0	0	0	0	0	0	24
South Carolina:											
Charleston	1	0	0	1	0	1	0	0	0	1	33
Columbia	0	0	0	0	0	0	0	0	0	6	14
Greenville	1	0	0	0	0	0	0	0	0	0	10
Georgia:											
Atlanta	4	8	3	0	0	7	1	0	1	0	94
Brunswick	0	1	0	0	0	0	0	0	0	0	2
Savannah	0	1	0	7	0	2	1	0	1	0	42
Florida:											
Miami		4		0	0	1		0	0	0	32
St. Petersburg	0		0		0	1	0		0		15
Tampa	1	1	0	0	0	0	0	1	0	0	30
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	1	0	0	0	1	0	0	0	0	24
Lexington		0		0	0	1		0	0	1	16
Louisville	6	19	0	2	0	6	0	0	0	4	88
Tennessee:											
Memphis	6	3	1	0	0	12	0	2	1	1	87
Nashville	2	0	0	0	0	6	0	1	0	2	55
Alabama:											
Birmingham	4	2	3	1	0	6	1	7	0	1	77
Mobile	1	2	0	0	0	1	0	1	0	0	32
Montgomery	0	1	0	0			0	0		1	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	0	0	1			0	0		0	
Little Rock	2	4	0	1	0	1	0	0	0	0	
Louisiana:											
New Orleans	5	5	1	0	0	18	2	4	1	2	169
Shreveport	1	2	0	1	0	4	0	0	0	2	32

City reports for week ended January 14, 1928—**Continued**

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL—contd.											
Oklahoma:											
Oklahoma City	3	2	1	21	0	2	1	0	0	0	49
Tulsa	2	5	1	0			1	0		0	
Texas:											
Dallas	4	8	2	3	0	3	1	0	0	2	75
Fort Worth	1	3	1	0	0	2	0	0	1	0	44
Galveston	1	3	0	0	0	1	0	0	0	0	18
Houston	2	3	2	1	0	4	0	1	1	0	86
San Antonio	1	6	0	0	0	8	0	0	0	2	82
MOUNTAIN											
Montana:											
Billings	2	0	0	0	0	0	0	0	0	9	7
Great Falls	1	1	1	0	0	0	0	0	0	0	5
Helena	0	4	0	4	0	1	0	0	0	0	5
Missoula	1	1	0	0	0	1	0	0	0	0	4
Idaho:											
Boise	1	0	0	0	0	0	0	0	0	0	5
Colorado:											
Denver	11	17	1	3	0	9	0	0	0	11	96
Pueblo	2	2	0	0	0	0	0	0	0	1	12
New Mexico:											
Albuquerque	1	1	0	0	0	6	0	0	0	0	16
Utah:											
Salt Lake City	3	9	2	9	0	0	0	0	0	2	30
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	3
PACIFIC											
Washington:											
Seattle	11	3	3	1			0	0		5	
Spokane	4	20	3	9			0	0		0	
Tacoma	3	1	4	1	0	0	0	1	0	1	22
Oregon:											
Portland	6	7	7	12	0	1	0	0	0	1	101
California:											
Los Angeles	28	37	4	0	0	21	2	0	0	14	291
Sacramento	2	2	0	1	0	0	0	1	0	0	28
San Francisco	15	23	1	0	0	17	1	2	0	14	173

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis: Cases	Poliomyelitis: Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	1	0	0	0	0	1	1	0
MIDDLE ATLANTIC									
New York:									
New York	1	1	2	2	0	0	1	2	1
New Jersey:									
Newark	0	0	1	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	2	0	2	2	0	0	0	0	0
Pittsburgh	0	0	0	1	0	0	0	0	0

City reports for week ended January 14, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cleveland	0	0	1	0	0	0	0	0	0
Columbus	0	0	1	1	0	0	0	0	0
Indiana:									
Indianapolis	1	2	0	0	0	0	0	0	0
Illinois:									
Chicago	6	4	0	0	1	1	0	1	0
Michigan:									
Detroit	0	0	0	0	0	0	0	1	0
Wisconsin:									
Milwaukee	2	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	2	1	0	0	0	0	0	0	0
St. Paul	0	0	0	0	0	0	0	1	0
Missouri:									
Kansas City	2	0	0	0	0	0	0	2	0
St. Louis	3	0	0	0	0	0	0	0	0
Kansas:									
Wichita	0	1	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	0	1	0	0	0	0	0
Cumberland	0	0	0	0	0	0	0	1	0
West Virginia:									
Charleston	0	0	0	0	0	0	0	0	1
South Carolina:									
Charleston [1]	0	0	0	0	3	0	0	0	0
Georgia:									
Savannah [2]	0	0	0	0	0	[illegible]	0	0	0
Florida: [2]									
St. Petersburg	......	1	......	0	......	0	0	......	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	1	0	0	0	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	1	0	0	0	1	0	0	0
Louisiana:									
New Orleans	0	0	0	0	0	1	0	0	0
Oklahoma:									
Oklahoma City	0	0	0	0	0	1	0	0	0
Texas:									
Dallas	0	0	1	1	2	3	0	0	0
Houston	1	1	0	0	0	0	0	0	0
San Antonio	1	1	0	0	0	0	0	0	0
MOUNTAIN									
Montana:									
Great Falls	1	0	0	0	0	0	0	0	0
Colorado:									
Denver	2	1	0	0	0	0	0	0	0
Utah:									
Salt Lake City	3	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	0	......	0	......	0	......	0	2	......
Spokane	4	......	0	......	0	......	0	0	......
Tacoma	0	0	0	0	0	0	0	1	0
Oregon:									
Portland	0	0	0	0	0	0	0	1	0
California:									
Los Angeles	2	1	1	1	0	0	0	1	1
Sacramento	1	0	0	0	0	0	0	0	0
San Francisco	0	0	0	0	0	2	0	1	0

[1] Dengue: 1 case at Charleston, S. C.
[2] Typhus fever: 2 cases at Savannah, Ga., and 2 cases at Tampa, Fla.

81881°—28——3

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended January 14, 1928, compared with those for a like period ended January 15, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, December 11, 1927, to January 14, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926-27 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928
101 cities	188	205	[2] 163	201	176	[3] 185	198	[4] 169	186	[5] 199
New England	160	200	160	193	158	165	158	149	174	200
Middle Atlantic	167	226	140	233	171	221	182	202	176	[5] 254
East North Central	213	248	[6] 182	212	193	200	223	176	189	220
West North Central	129	129	113	123	165	125	188	115	158	111
South Atlantic	216	140	[7] 214	143	173	129	222	[8] 154	215	142
East South Central	145	127	150	127	186	112	137	90	248	50
West South Central	258	218	168	344	223	[3] 271	252	[3] 246	244	204
Mountain	164	162	137	117	137	63	126	71	117	115
Pacific	252	168	225	157	155	141	230	123	193	143

MEASLES CASE RATES

	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928
101 cities	193	247	[2] 209	285	231	[3] 323	384	[4] 518	339	[5] 494
New England	229	604	167	536	184	708	253	917	195	1,021
Middle Atlantic	24	206	22	251	22	331	31	466	38	[5] 277
East North Central	256	117	[6] 249	157	294	160	427	265	406	300
West North Central	109	46	77	38	61	46	259	134	192	109
South Atlantic	89	607	[7] 62	797	179	832	204	[8] 1,461	202	1,496
East South Central	21	530	21	713	78	397	106	1,566	96	1,521
West South Central	82	252	103	84	13	[3] 116	186	[3] 197	302	268
Mountain	2,351	27	2,780	18	3,545	36	5,227	62	3,434	106
Pacific	603	238	879	257	697	283	1,517	383	1,478	526

SCARLET FEVER CASE RATES

	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928
101 cities	279	211	[2] 253	187	267	[3] 210	318	[4] 208	366	[5] 258
New England	387	325	248	281	356	346	491	340	479	398
Middle Atlantic	214	199	212	173	235	200	285	196	338	[5] 267
East North Central	241	243	[6] 255	212	245	257	288	234	345	285
West North Central	413	204	371	202	385	193	449	203	556	261
South Atlantic	199	163	[7] 171	145	238	149	231	[8] 152	258	168
East South Central	248	143	243	117	176	117	233	190	213	140
West South Central	236	172	125	92	150	[3] 129	153	[3] 103	141	124
Mountain	1,112	243	975	171	893	234	950	195	1,112	301
Pacific	383	154	303	191	252	126	340	184	376	220

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1926, 1927, and 1928, respectively.
[2] Terre Haute, Ind., and Norfolk, Va., not included.
[3] Fort Smith, Ark., not included.
[4] Atlanta, Ga., and Fort Smith, Ark., not included.
[5] Buffalo, N. Y., not included.
[6] Terre Haute, Ind., not included.
[7] Norfolk, Va., not included.
[8] Atlanta, Ga., not included.

Summary of weekly reports from cities, December 11, 1927, to January 14, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926–27—Continued

SMALLPOX CASE RATES

	Week ended—									
	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928
101 cities	16	19	[2] 14	16	14	[3] 15	22	[4] 17	22	[5] 23
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	1	0	0	0	1	0	0	0	1	[5] 0
East North Central	11	17	[6] 16	12	7	12	32	9	21	7
West North Central	46	115	28	77	40	79	57	105	69	146
South Atlantic	26	5	[7] 30	10	41	4	27	[8] 12	51	26
East South Central	78	5	36	20	47	10	41	5	86	15
West South Central	43	0	26	13	21	[3] 4	41	[3] 16	25	28
Mountain	0	117	18	99	9	144	0	106	0	142
Pacific	40	31	43	26	21	29	10	26	37	31

TYPHOID FEVER CASE RATES

	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928
101 cities	12	8	[2] 10	11	12	[3] 7	8	[4] 5	9	[5] 8
New England	31	0	40	9	24	14	9	7	21	14
Middle Atlantic	8	8	5	10	7	4	6	3	8	[5] 6
East North Central	5	3	[6] 3	8	5	5	5	3	1	3
West North Central	10	6	10	8	4	10	8	2	6	8
South Atlantic	10	9	[7] 16	16	34	13	7	[8] 15	16	2
East South Central	21	36	16	25	21	10	25	20	15	55
West South Central	21	17	17	17	17	[3] 13	25	[3] 0	17	20
Mountain	9	18	0	9	27	18	9	9	9	0
Pacific	24	16	21	10	16	0	8	5	21	10

INFLUENZA DEATH RATES

	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928
95 cities	14	14	[2] 15	17	17	10	20	[5] 10	21	[5] 24
New England	7	12	7	5	12	5	16	16	14	7
Middle Atlantic	13	9	14	11	21	14	18	13	20	[5] 21
East North Central	12	11	[6] 10	13	15	10	17	10	16	13
West North Central	15	6	11	10	8	8	14	4	10	14
South Atlantic	26	15	[7] 34	20	17	22	16	[8] 21	23	37
East South Central	5	61	36	46	26	56	48	89	37	78
West South Central	40	56	18	73	13	82	42	82	42	66
Mountain	9	9	27	27	46	72	63	53	99	62
Pacific	7	17	4	24	0	31	10	24	14	37

PNEUMONIA DEATH RATES

	Dec. 18, 1926	Dec. 17, 1927	Dec. 25, 1926	Dec 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928
95 cities	137	118	[2] 137	135	164	157	195	[5] 170	179	[5] 191
New England	149	102	151	121	172	146	181	103	191	179
Middle Atlantic	147	117	166	127	180	158	208	186	204	[5] 215
East North Central	117	97	[6] 109	105	134	135	169	140	152	158
West North Central	120	91	91	98	118	108	116	124	124	112
South Atlantic	127	164	[7] 153	180	187	188	220	[8] 231	189	252
East South Central	129	143	109	204	191	183	213	235	207	225
West South Central	172	194	84	233	150	310	238	238	178	287
Mountain	273	135	164	243	201	198	368	195	197	168
Pacific	124	131	148	165	198	138	210	176	169	142

[2] Terre Haute, Ind., and Norfolk, Va., not included.
[3] Fort Smith, Ark., not included.
[4] Atlanta, Ga., and Fort Smith, Ark., not included.
[5] Buffalo, N. Y., not included.
[6] Terre Haute, Ind., not included.
[7] Norfolk, Va., not included.
[8] Atlanta, Ga., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31, 050, 300	31, 657, 000	30, 369, 500	30, 960, 700
New England	12	12	2, 242, 700	2, 274, 400	2, 242, 700	2, 274, 400
Middle Atlantic	10	10	10, 594, 700	10, 732, 400	10, 594, 700	10, 732, 400
East North Central	16	16	7, 820, 700	7, 991, 400	7, 820, 700	7, 991, 400
West North Central	12	10	2, 634, 500	2, 683, 500	2, 518, 500	2, 566, 400
South Atlantic	21	21	2, 890, 700	2, 981, 900	2, 890, 700	2, 981, 900
East South Central	7	6	1, 028, 300	1, 048, 300	980, 700	1, 000, 100
West South Central	8	7	1, 260, 700	1, 307, 000	1, 227, 800	1, 274, 100
Mountain	9	9	581, 600	591, 100	581, 600	591, 100
Pacific	6	4	1, 996, 400	2, 046, 400	1, 512, 100	1, 548, 900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended December 31, 1927.—The following report for the week ended December 31, 1927, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt—Alexandria
India—Bombay, Rangoon, Bassein
Dutch East Indies.—Makassar

CHOLERA

India—Negapatam, Calcutta, Rangoon
Straits Settlements—Singapore
Siam—Bangkok

SMALLPOX

Aden—Aden
Iraq—Basra
India—Bombay, Calcutta, Rangoon
French India—Pondicherry
Dutch East Indies—Belawan Deli, Surabaya.
Siam—Bangkok
French Indo China—Saigon

Returns for the week ended December 31 were not received from Madras, India, Colombo, Ceylon, Canton, China, Samarinda, Dutch East Indies, or Vladivostok, Union of Socialist Soviet Republics.

ARABIA

Aden—Epidemic plague—January 23, 1928.—Under date of January 23, 1928, plague was reported present in epidemic form at Aden, Arabia.

ARGENTINA

Rosario—Plague—Measures against spread.—Press reports from Buenos Aires, Argentina, state the recent occurrence of six cases of plague at Rosario. Notices from the same source show that active measures against the spread of the disease are in force at Rosario, including campaign against rats, which are stated to exist in great numbers in the port, and the immunization of about 300 workmen.

BELGIAN CONGO

Matadi—Yellow fever.—Further information relative to yellow fever at Matadi, Belgian Kongo, reported present January 3, 1928,[1] shows under date of December 25, 1927, 9 suspect cases, 6 fatalities from the disease, and 2 cases under observation.

[1] Public Health Reports, Jan. 27, 1928, p. 240.

BRAZIL

State of Parahyba—Health conditions—July, 1926, to June, 1927.—Information received under recent date shows the sanitary and general health status of the State of Parahyba, Brazil, during the year, to have been satisfactory, with exception of increased mortality from malarial diseases, tuberculosis, and gastroenteritis in children.

Influenza.—Some cases of influenza were reported at Alagoa Nova and Teixeira. At Cajazeiras and Misericordia smallpox made its appearance. Medical relief was supplied to these localities by the Department of Health.

Plague.—An outbreak of plague occurred during the period under report at the town of Sape, with 42 cases and 36 fatalities. The infection was attributed to rats which were brought into the town in a consignment of packing cases, containing, it was stated, machinery for installation in a large sugar plant.

Rural sanitation.—Rural sanitation was stated to be in progress, being directed mainly to the eradication of hookworm disease, leprosy, malaria, and the venereal diseases, the work being carried on at 23 stations throughout the State and in the capital city.

Water works and sewer construction.—The water works and sewerage system were declared completed as regards the capital city, Parahyba, January 24, 1926, but the work of house connections and extension of water lines was not finished. The water supply system of Campina Grande was officially opened in October, 1927.

Yellow fever prevention work.—The work of yellow fever prevention was stated to have been carried on during the year. The last case to occur in the city of Parahyba was reported in June, 1926, and the last case in the State as a whole, in August, 1926.

CANADA

Communicable diseases—Week ended January 7, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended January 7, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever			1	1				2
Influenza	14			2				16
Lethargic encephalitis				3				3
Poliomyelitis				1			1	2
Smallpox				83	2	15	3	103
Typhoid fever	7	15	22	17			1	62

Communicable diseases—Week ended January 14, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended January 14, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever			1			2		3
Influenza	7			1				8
Poliomyelitis				1				1
Smallpox	1			76	5	12	5	99
Typhoid fever	8	4	37	9		3		61

Ottawa—Mortality—Year ended October 31, 1927.—The general death rate of the city of Ottawa, Province of Ontario, Canada, for the year ended October 31, 1927, was lower than for any year previously reported, with the exception of the year 1925. The lowered death rate was attributed to lower infant mortality, viz, 74 fewer deaths of infants than for the preceding year. The total number of deaths reported was 1,551, as compared with 1,639 in 1926.

Measles—Typhoid fever—Tuberculosis.—An outbreak of measles was reported for the months of December, 1926, and January and February, 1927, the type of the disease being generally mild. There were reported 1,541 cases with 4 deaths.

The prevalence of typhoid fever was attributed mainly to the development of cases of the disease in the Gatineau district of Quebec, in which many citizens of Ottawa were employed in construction work and from which many cases were sent to Ottawa hospitals. In the city of Ottawa 28 cases originated.

There were reported 94 deaths from tuberculosis, as compared with 85 in 1926. Of this number, 82 per cent were said to be due to pulmonary tuberculosis.

Quebec Province—Communicable diseases—Week ended January 14, 1928.—The Bureau of Health of the Province of Quebec reports cases of communicable diseases for the week ended January 14, 1928, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Scarlet fever	122
Chicken pox	39	Smallpox	17
Diphtheria	98	Tuberculosis	69
German measles	2	Typhoid fever	15
Measles	137	Whooping cough	28

EGYPT

Alexandria—Plague—December 17-23, 1927.—During the week ended December 23, 1927, a case of plague was reported at Alexandria, Egypt.

Summary and comparison with corresponding period of the preceding year.—During the period January 1 to December 23, 1927, 77 cases of plague were reported in Egypt, as compared with 150 cases reported for the corresponding period of the year 1926.

ESTONIA

Communicable diseases—November, 1927.—During the month of November, 1927, communicable diseases were reported in the Republic of Estonia as follows:

Disease	Cases	Disease	Cases
Diphtheria	33	Tuberculosis	129
Measles	43	Typhoid fever	65
Scarlet fever	323		

Population, census, 1,107,059

IVORY COAST (WEST AFRICA)

Abidjan—Yellow fever—December 24, 1927.—Under date of January 4, 1928, a fatal case of yellow fever occurring in a European was reported at Abidjan, Ivory Coast, West Africa. The locality was stated to be under sanitary observation.

MADAGASCAR

Plague—October 16-31, 1927.—During the 16-day period ended October 31, 1927, 104 cases of plague with 97 deaths were reported in the island of Madagascar. The distribution according to Provinces was as follows: Ambositra, 2 cases; Antisirabe, 17; Itasy, 11; Moramanga, 20; Tananarive, 54. The distribution according to type of disease was as follows: Bubonic, 50 cases; pneumonic, 43; septicemic, 11. In the interior town of Tananarive the occurrence was as follows: Cases, 5; deaths, 5; bubonic, 1; pneumonic, 3; septicemic, 1.

SENEGAL

Dakar—Yellow fever—Diourbel, suspect yellow fever.—Under date of January 4, 1928, one case with one death of yellow fever was reported at Dakar, Senegal. On the same date one suspect case with fatal termination, occurring in a Syrian arriving from Dar-Mousti, was reported at Diourbel.

UNION OF SOUTH AFRICA

Cape Province—Plague—December 4-10, 1927.—During the week ended December 10, 1927, two cases of plague, one of which resulted fatally, occurring in the colored or native population, was reported in Hanover District, Cape Province, Union of South Africa.

Smallpox—Typhus fever.—During the same period outbreaks of smallpox and typhus fever were reported in the Union of South Africa as follows: Smallpox—Orange Free State, in one district. Typhus fever—Outbreaks in the Cape Province in the districts of St. George, Tsolo, and Xalanga. At Durban, Natal, one sporadic case, occurring in a native, was reported.

VIRGIN ISLANDS

Communicable diseases—December, 1927.—During the month of December, 1927, communicable diseases were reported in the Virgin Islands of the United States as follows:

Island and disease	Cases	Island and disease	Cases
St. Thomas and St. John:		St. Thomas and St. John—Continued.	
Chancroid	1	Syphilis	5
Dengue	1	Whooping cough	1
Gonorrhea	4	St. Croix:	
Sprue	1	Tetanus	1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Week ended—																	
		September, 1927				October, 1927					November, 1927				December, 1927				
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31
China:																			
Amoy	C	18	21	19	14	10	4	2											
	D	1	2																
Canton	C	10	17	7	2	6		2	6	5	1	6			1				
	D	6	10	7	2	6		2	6	5	1	5			1				
Foochow	C	P		P	P	P	P	P	P										
Hong Kong	C	1	P	P	P	P	P	P											
	D	1																	
Shanghai	C	1	3	2		1	2												
	D	25	22	21	6	4		2	1										
Swatow	C	P	P		P		P	P	P	P	P								
Tientsin	C	4	3	5	3	2										1			
India	C	11,180	8,391	6,630	5,189	4,907	4,055	6,142	5,056	5,[illegible]	4,845	5,987	6,912						
	D	5,559	4,278	3,532	2,526	2,549	2,104	3,027	2,691	2,[illegible]	2,641	3,350	4,005						
Bombay	C	1	1	1								2							
	D	1	[illegible]									2							
Calcutta	C	18	19	20	19	21	13	34	33	28	35	65	71	156	119	87	66		
	D	10	13	5	11	15	11	19	19	22	25	42	49	106	77	55	43	48	34
Madras	C	29	8	15	7	4	9		1			6	7			1			
	D	24	11	6	7	3	3	1	1			3	4	1		1			
Rangoon	C				2	3	1		2		1		1	3	1	2			
	D				2	3	1		1	1		3	4	2	1	2	1	1	1
Tuticorin	C					1									6		2		
	D					1				7	5	10	15		6	6	2		
India, French Settlements in	C	6	4	1															
	D	3	4	1															
Karikal	C	1									1								
	D	1									1								
Pondicherry	C	4	4	1	6						1								
	D	2	4	1	8						1								
Indo-China: Saigon	C						1			1									

Iraq:[1]																			
Amarah	C								35	4	8	3	2		1	1			
	D								23	6	8	3	2		1	1			
Baghdad	C								1		10	13	8	3	38				
	D								1		5	2	2	3	38				
Basra	C								1										
Diwaniyah	C								28	4	3	1	2						
	D								17	2			1						
Diyala	C														1				
	D														1				
Dulaim	C														1				
Hillah	C								12	7	3	5	53		7				
	D								7	6	2	1	29		4				
Kerbala	C								3	1	4	2	2						
	D								3	1	5	2	2						
Kut	C								11	9	1	5							
	D								8	4	1	3							
Muntafique	C								4			4	14		8				
	D								1			2	10		8				
Ramadi	C									19	18	27	21						
	D									10	23	14	16		1				
Java: Batavia	C										1	2	25	2	1				
	D										1	2	15	2	1				
Philippine Islands	C								4										
Siam	C	4	5	21		6	4	8	8	14	23	43	30	19	21				
	D	3	3	11		4	2	5	7	10	15	25	26	11	19				
Bangkok	C	1	1	1			2	3	1		1		3		1	1	1	2	3
	D			1				3	1		1		1		1		1	2	1
Straits Settlements: Singapore	C									1		4	2	1	2		2	3	12
	D									1		4		2			2	1	3
On vessel S. S. Tabaristan at Basra	C						1												

Place		September, 1927			October, 1927			November, 1927			December, 1927	
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Indo-China (French)	C	452	206	241	220	345	50	100	103			
Annam	C	358	146	106		140	27	13	75	33	16	2
Cambodia	C	8	25	42		97	5	56	1	23	21	12
Cochin-China	C	17	35	92		79	12	21	27	52	17	33
Laos	C	16				29	6	10				
Tonkin	C	23		1			1			1		

[1] From July 24 to Oct. 22, 1927, 926 cases and 677 deaths from cholera were reported in Iraq, of these 166 cases and 126 deaths occurred in Amarah; 417 cases and 337 deaths in Basra; 81 cases and 47 deaths in Diwaniyah: 19 cases and 12 deaths in Hillah; 34 cases and 21 deaths in Kerbala; 8 cases and 6 deaths in Kut; and 185 cases and 118 deaths in Muntafique.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths, P. present]

Place		Week ended—																		
		September, 1927				October, 1927					November, 1927				December, 1927					January, 1928
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7
Algeria: Oran	C		1																	
	D		1								1		1							
Argentina:																				
Bahia Blanca District	C													1	1	1				
Cordoba Province	C					P	P	P	P	P	P			10				1	1	
Firmat	C																1			
Quilino	C													1	1	1				
Rosario	C													1	1	1	1	2	3	
Unacha	C																1			
Azores: St. Michaels Island	C		1		1	1			2	1		1	1	1	1	1				
	D		1			1										1				
British East Africa:																				
Tanganyiki	C				P	P		P	P	P	P									
Uganda	C	96	48	47	35	25	46	28												
	D	67	44	25	22	23	39	26												
Canary Islands: Las Palmas	C						4	4	1					1			2			2
Ceylon: Colombo	C	1		1	1	2			1					1	1					
	D	1		1	1	1														
China: Tungliao	D							200												
Dutch East Indies:																				
Balik-Papan	C																	1		
	D																	1		
Cheribon	C													1						
	D													1						
Java	D	123	129	112	168	184	193	176	226	191	213									
Batavia	C	18	14	17	21	24	33	42	31	41	29	31	34	45	43					
	D	18	14	17	21	24	33	41	31	41	29	31	34	44	43					
East Java and Madura	C	5	4	2	7	3	3	7	4	3	4	2	1	5						
	D	5	4	2	7	3	3	7	4	3	4	2	1	5						
Makassar	C										2	2	2	1		1		2	1	
	D										2	2	2	1		1		2	1	
Egypt:																				
Alexandria	C	1												5	3	2	2	2		
	D													5	2				1	
Suez	C		1																	

Greece:																				
Mitylene	C				5		1			1		2		1	1	1				
Patras	C	2				1					1									
	D					1					1									
India	C	403	1,087	612	608	655	715	920	956	812	1,015	856	919							
	D	216	569	324	319	381	359	508	544	495	551	485	554							
Bombay	C	3	1	1	2		2		2											
	D	2	1	1	1		2		1										1	
Calcutta	C	18																		
	D	10																		
Madras	C	144	111	87	123	88	156	167	172		83	152		190						
	D	76	62	43	49	60	72	72	84		54	80		111						
Rangoon	C	2		4		3	4	1	3	5	2		4	5	2	6				
	D	2		4		3	4	1	3	5	2		4	5	2	5		2	3	
Indo-China: Saigon	C		1	1									1							
Senegal:																				
Baol	C	32		27	13	39		56					P		P					
	D	11		15	7	26		14												
Cayor	C	81	103	175	104	101	45	20	10	32	8	8	P							
	D	27	58	90	58	57	16	10	5	20	4	4								
Dakar	C	9	5	5	1	1														
	D	4	4	3	1															
Louga	C				5		8													
	D				4															
Rufisque	C	4	9	2	1															
	D	3	7	1	1															
Thies	C	2		2	5					1										
	D	2		1	4															
Siam	C						1	11	1					2						
	D						1	8			1			1						
Bangkok	C						1		1											
	D										1									
Straits Settlements: Singapore	C											1								
	D											1								
Turkey: Constantinople	C				1	1								1	1					
	D					1									1					
Union of South Africa:																				
Cape Province—																				
Richmond District	C									2										
	D									2										
Orange Free State	C												1	8	P					
	D												1	6						
U. S. S. R.:																				
Chita District	C							1												
	D							1												
Northern Caucasus	C		3	1	10	1														
	D		2	1	7															
On vessel:																				
S. S. Aghios Gerasimos at Vigo, Spain	C												3							
At La Plata from Rosario, Argentina	C																		1	

Indo-China (French), 3 cases, Dec. 11-20; Beirut, Syria, 1 case, Dec. 1-10.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths, P, present]

Place		July	August	September	October	November	December
Algeria: Algiers	C				2		
British East Africa: Kenya	C	13	61	21	18	28	
Ecuador: Guayaquil	C	5	7	3	4	9	5
	D					3	2
Indo-China (French)	C			14	3	3	
Madagascar	C	46	98	170	166		
	D	43	89	154	155		
Ambositra Province	C	6	1				
	D	6	1				
Antisirabe Province	C		34	5			
	D		34	4			
Itasy Province	C	14	11	21			
	D	14	7	20			
Madagascar—Continued.							
Moramanga Province	C	5	4	3			
	D	5	4	3			
Tananarive Province	C	21	48	142			
	D	19	43	127			
Mauritius	C			1			
Peru	C	8	11	15	14		
	D	7	6	6	5		
Callao	D	3					
Lima	D				1		
Syria: Beirut	C			1	1		

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Week ended—																			
		September, 1927				October, 1927					November, 1927				December, 1927					January, 1928	
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14
Algeria	C										294	218	149								
Algiers	C																3	3			
Oran	C										10	4	6	9	11	10	9	8			
Arabia: Aden	C												1		1		1				
Brazil: Rio de Janeiro	D			6						1											
British East Africa: Tanganyika	D			8				7	P	P	P	P									
British South Africa:																					
Northern Rhodesia	C		18	16	5	10	97	44	13	150	10	22	3	57	15	125					
	D				2	3	7	1	4	40	23		1	18	7	28					
Southern Rhodesia	C												3								

Canada:																					
Alberta	C	3	1	5	8	5	4	5	9	6	2	1	1	7	3	3	6		3		
Edmonston	C									1				6		1	1			3	
British Columbia—																					
Vancouver	C	2														4		1	3	8	1
Manitoba	C	2		7			2		5	3	14		2	1	3	1	2	2			
Winnipeg	C			4			1		1				2			1	1	1			1
New Brunswick	C			2														1			
Nova Scotia	C			1				1													
Halifax	C							1													
Ontario	C			12	10	6	23	26	38	64	38	77	85	71	90	82	104		53		
Hamilton	C														2						
Kingston	C												1					1			
Ottawa	C	9	13	12	6	3	15	28	26	47	17	51	19	10	19		34	18	9	20	23
Toronto	C		1		1		3	1	6	2	16	3	13		25	14		7		11	10
Windsor	C							9													
Quebec	C								8	7	3	12	3	8	5	3		14	3	6	17
Montreal	C											1						1		1	6
Quebec	C														2		2		2	10	3
Riviere du Loup	C												3								
Saskatchewan	C	13	33		22	12		8	11	5	12	2	14	9	15	19	15	12	13		
Moose Jaw	C		9		7				3								1		1	2	1
Regina	C						5					1					1				
Saskatoon	C															2			4		
Ceylon: Colombo	C														1						
China:																					
Canton	C				1																
	D				1																
Chefoo	C				1			P		P				P							
	D				1																
Foochow	C		P					P	P		P			P							
Hong Kong	C	2																			
	D	1		1																	
Manchuria—																					
Changchun	C													1							
Dairen	C								1		2							1			
	D								1												
Fushun	C			1								1									
Mukden	C					1			1	1											
Pensihu	C					1															
Tientsin	C					12			1	8				4	1	2	2	2			
Egypt	C	3													4						
	D	1				1											1				
Cairo	C														1						
Great Britain:																					
England and Wales	C	111	146	123	125	122	149	124	200	199	219	258	226	233	366	230	212	255	247		
Bradford	C									1	5	3	2	9	6	2	2	2	2		
Bristol	C								6	1			3	2	4	2					
Cardiff	C									1											
Leeds	C	3				3	1		6	1	1	1	2	3	3	6	4	4	6		
Manchester	C						1	2			1	1	4	2	5	10	8		1		
Newcastle upon Tyne	C			2		1		5		2	6		1	28	18	5	4	2	13		
Sheffield	C				1		3	3	4	4			2	1	8						

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths, P, present]

Place		Week ended—																			
		September, 1927				October, 1927					November, 1927				December, 1927						
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14
India	C	1,456	1,109	1,111	722	923	593	777	860	779	805	1,235	1,233								
	D	397	266	284	173	179	159	171	206	190	200	211	326								
Bombay	C	7	3	1	1	4	2		4	2		2			4				4		
	D	5	2	1					2	2		1			1						
Calcutta	C	4	6	10	2		4	1					5	4	3	11	7		17		
	D	2	5	5	2		3	1	1				2	2	1	6	2		17		
Madras	C	2		3	2	3	1	2	2	3		2	2	2	2	5	2	2			
	D			1	1					1		1		1	1	1		1			
Rangoon	C	2		1	6	2	8		7	4		1	1	5	2	1			28		
	D	1			1	1	1		1	1				1	1				13		
India, French settlements in:																					
Karikal	C				1	1		1													
	D				1	1		1													
Pondicherry	C	11	8	2	16	9	7	10	12												
	D	11	8	2	16	9	7	10	12												
Indo-China: Saigon	C		1																	1	
Iraq:																					
Baghdad	C		1			5			2			5		1	5						
	D		1			3			1			4			5						
Basra	C			4				2					3								
	D			4				2					1								
Italy: Rome and vicinity	C		1																2		
Jamaica (outside Kingston) (alastrim)	C	2	2	2	3	1	4	4		7				1		1	1		1		
Kingston (alastrim)	C	2		1			2												2		
Java:																					
Batavia	C					3		1				25									
	D											15									
East Java and Madura	C		14	3	5	1		7		1	3	5		4							
	D							1													
Mexico:																					
Acapulco	C	1		1								1									
	D	1		1								1									
Chihuahua	D																			1	
Guadalajara	D													1			1				
Mexico City and surrounding territory	C													1	1	1	1				
Torreon	D						2														

Palestine: Jerusalem	C														1						
Portugal:																					
Lisbon	C	1		1	1	1	4	1	2	1	2										
Oporto	C		1																		
Siam	C	24	3				3	3					1		8						
	D	14	1																		
Bangkok	C												1		1						
Spain:																					
Malaga	D												1								
Valencia	C					1													1		
Straits Settlements: Singapore	C											1									
Union of South Africa:																					
Cape Province	C						P														
Orange Free State: Bothaville District	C												P	P	P	P					
Transvaal: Johannesburg	C													7							
Venezuela: Maracaibo	D			2			1														

Place		September, 1927			October, 1927			November, 1927			December, 1927
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Algeria	C	110	162	110	182	386	115				
Oran	C	4		12	6		5				
Indo-China	C	6	6	9	5	4	16	13	3	22	10
Syria:											
Beirut	C										1
Damascus	C		1	4	14	8			13		4

Place		July	August	September	October	November	December
Angola	C	42	2	5	73		
	D				2		
Congo	C			5	77		
Cuanza-Norte	C			1			
Cuanza-Sul	C				2		
Loanda	C			1			
Zaire	C			3	4		
Brazil: Porto Alegre	C	5	3	3	4		
British East Africa: Zanzibar	C				2		
	D				1		
Chosen	C	19	2				
	D	6					
Ecuador, Guayaquil	C		2	2	1	1	4
France	C	23	6	8	7	4	
Gold Coast	C	1	1	5			
Greece	C	3	3	4	4		
Latvia	C				2		
Mexico	D	93	73	55			
Morocco	C	53	76	51	81		
Nigeria	C	492	91	237			
	D	83	20	70			
Spain: Madrid	D					1	
U. S. S. R.:							
Railways, etc.	C	11	6				
Other territories in Europe	C	146	111				
Transcaucasus, Siberia, and Central Asia	C	36	29				
Ukraine	C	16	4				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Week ended—																	
		September, 1927				October, 1927					November, 1927				December, 1927				
		3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31
Bulgaria: Sofia	C					8	4	3	2	3	1	2					1	1	4
	D										1								
Chile:																			
Antofagasta	D					1													
Valparaiso	C	1												1	1				
	D	1											1						
China:																			
Manchuria—Harbin												1							
Tientsin	C				2														
Egypt	C					3	3	5	1		4			1	7	3		1	
	D					2	1	1	1						5	1			
Port Said	C					1									1				
Ireland:																			
Cork County	C															3			
Donegal County—Letterkenny	C								4										
Mexico:																			
Guadalajara	D													1					
Mexico City (including municipalities in Federal District)	C	9	4	1	5	7		3	8	9	6	2	11	7	6	4		4	
	D										2						1	1	
Palestine	C	3		5			3					1	2	3	1				
Haifa	C						2						1	1					
Herzliah	C													1					
Jaffa	C					1								1					
Nazareth	C												1						
Safad	C													1		1			
Tel-Aviv	C						1							1	1				
Poland	C	12	5	12	6	10	9			35	12	6	11		28	17			
	D			2		3	1			6	3		2		5				
Portugal: Oporto	C									1								1	
Rumania	C	2	2	9	3	5							2						
	D					1													
Syria: Alppo	C			2															
Tunisia	C			1				2	1			1					1	1	

Union of South Africa:																			
Cape Province	C	P				P	P	P	P		P	P	P	P	P	P			
Natal	C								P		P	P	P	P	P	P			
Orange Free State	C					P										P			
Transvaal	C										P	P	P	P	P	P			
Johannesburg	C							5											

Place		September, 1927			October, 1927			November, 1927			December, 1927	
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Algeria	C	5	3	2	7	4	1					
	D					1						
Algiers	C	1	5		1	1						
Bulgaria	C	5	1	1		1	1					
	D		1	1		1						
Morocco	C	3	2	2	6	4	1	5	14	7	5	6

Place		July	August	September	October	November
Argentina	C					1
Chosen	C	72	17			
	D	8				
Chemulpo	C	1	2			
Gensan	C	2				
Seoul	C	2	3		2	
	D	1			1	
Czechoslovakia	C	6				
Greece: Athens	C	1				
Japan	C	1				
Latvia	C	6				
Lithuania	C	44	18	7	9	18
	D	5	8	1	1	1
Mexico	D	12	38	14		
Peru:						
Arequipa	D		2	1	2	
Lima	D	8				
U. S. S. R.:						
Railways, etc	C	30	22			
Transcaucasus, Siberia, and central Asia	C	79	69			
Ukraine	C	96	85			
Other territories in Europe	C	732	552			
Yugoslavia	C	11	9		1	1
	D	4	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C, indicates cases; D, deaths; P, present]

ace	Week ended—													
	September, 1927				October, 1927				November, 1927				[illegible]	
	3	10	17	24	1	15	22	29	5	12	19	26	3	1

Rufisque	C						1											
	D						1											
St. Louis	C					1												
	D					1												
Sebikotane	C							1		2	1							
	D							1			1							
Thies	C			1	2	1		1	1	2	1	1						
	D			1	2	1		1	1	2	1	1						
Tiaroye	C	1																
	D	1																
Tivaouane	C		1															
On vessel S. S. Desirado, at Leixoes, Portugal	C			1														
	D			1														

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

X

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 43 :: :: NUMBER 6

FEBRUARY 10 - - 1928

SPECIAL ARTICLES

Prevalence of Diphtheria in the United States

Sickness Incidence, by Occupation, in a Public Utility

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen. R. C. WILLIAMS, *Chief of Division*

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They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 43 FEBRUARY 10, 1928 NO. 6

PREVALENCE OF DIPHTHERIA IN THE UNITED STATES

The diphtheria case and death rates for the year 1926 were the lowest ever recorded. The death rate for diphtheria for that year in the registration area was 7.5 per hundred thousand, and the case rate in 47 States was 80 per hundred thousand. In 1927 there was a reaction. Preliminary reports from 37 States show an increase in 1927 over 1926 of 16.7 per cent, and an increase in 1927 over 1925 of 15 per cent. The figures are as follows:

Cases of diphtheria reported in 37 States for 52 weeks of the years 1925, 1926, and 1927

	Cases
1925	69, 624
1926	68, 668
1927	80, 152

These 37 States had a population in 1927 of about 90,500,000.

The greatest prevalence of diphtheria usually occurs in October, November, and December. The following table gives a comparison of the weekly telegraphic reports from 37 States for the last 20 weeks of the years 1925, 1926, and 1927:

Diphtheria cases reported by 37 States for last 20 weeks of years 1925, 1926, and 1927, by four-week periods

4 weeks ended—	1927	Corresponding weeks—	
		1926	1925
Sept. 10	3, 857	2, 905	3, 400
Oct. 8	5, 771	5, 171	5, 205
Nov. 5	8, 699	9, 929	7, 478
Dec. 5	9, 106	8, 970	7, 293
Dec. 31	7, 809	7, 055	5, 785
Total	35, 242	34, 030	29, 161

The increase in number of cases during the last 20 weeks of 1926 was more marked than it was in either of the other years.

SICKNESS AMONG PERSONS IN DIFFERENT OCCUPATIONS OF A PUBLIC UTILITY [1]

By Dean K. Brundage, *Assistant Statistician, United States Public Health Service*

In a previous report[2] the general results of a study of disabling sickness among employees of the Edison Electric Illuminating Co. of Boston in the 10 years ending December 31, 1924, were given. In the present communication the frequency of sickness during the last 3 years of this period is presented for certain occupations in the public utility. The record covers all absences for 1 full working day or longer on account of disability. Liberal sick leave is granted, especially to those who have been with the company more than 1 year, amounting practically to the payment of full wages during the entire period of incapacitation up to a maximum of 15 weeks.[3] During the period under review the company physician called at the homes of a large proportion of those who reported themselves as unable to work on account of sickness or accident. A physician's diagnosis was thus obtained for 81 per cent of the disabilities which lasted 2 days or more, and 58 per cent of the disablements for 1 day only, during the years 1922, 1923, and 1924.

"EXPOSURE" ESTIMATED

The most accurate method of obtaining the divisor for computing a sickness rate is to add the number of days during which each employee was on the pay roll during the period under study and divide the total by 365 (number of calendar days in the year). The quotient thus obtained represents the equivalent number of employees on the payroll for a full year. But on account of the large amount of clerical labor required to obtain the "exposure" data in this way, the population "at risk" was approximated by the following method:

The number of persons in each occupation as of July 15, 1923 (the approximate mid-point of the three years 1922 to 1924), was obtained from the pay-roll records of the company. The sex, age, and number of years in the employ of the company up to July 15, 1923, were also obtained for each person. The per cent of total persons in each occupation who were in different age and length-of-service groups was computed and applied to the sum of the average number in the occupation during each of the three years, the annual averages being based on the exact number in each occupation at the end of each month.

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[1] From the Office of Industrial Hygiene and Sanitation in cooperation with the Office of Statistical Investigations of the U. S. Public Health Service.

[2] A 10-Year Record of Absences from Work on Account of Sickness and Accidents. Public Health Reports, vol. 42, No. 8 (Feb. 25, 1927), pp. 529-550. (Reprint No. 1142.)

[3] The sick-leave provisions of the company are given in detail on p. 3 of the reprint mentioned in footnote 2.

The products which represent the approximate number of years of life under observation are given for two service groups and for all lengths of service, by occupations, in Table 10, and the sex and age distribution within each numerically important occupation are shown in Table 12. With these approximations of the equivalent number of persons under observation for one full year in the different sex, age,

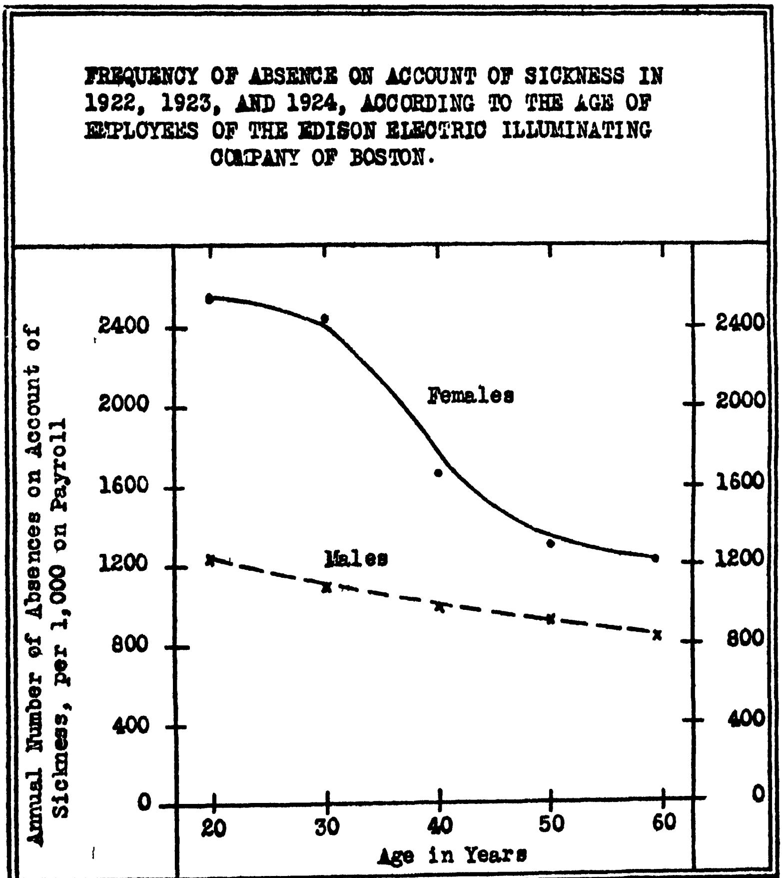

FIG 1

and length-of-service groups, by occupation, and with the absences on account of sickness similarly classified and tabulated, it was possible to express the sickness in terms of rates per 100 or per 1,000 persons in the different occupations, and according to age, sex, and length of service. The rates shown in all the tables with the exception of the last one (Table 13) do not include accidents either of industrial or nonindustrial origin.

FREQUENCY OF SICKNESS ACCORDING TO AGE

The frequency of absence for one day or longer on account of sickness gradually decreased as age advanced among the male employees of the public utility, and declined sharply between the ages of 30 and 50 among the women. This result was surprising, inasmuch as the age incidence of illness in the general population of Hagers-

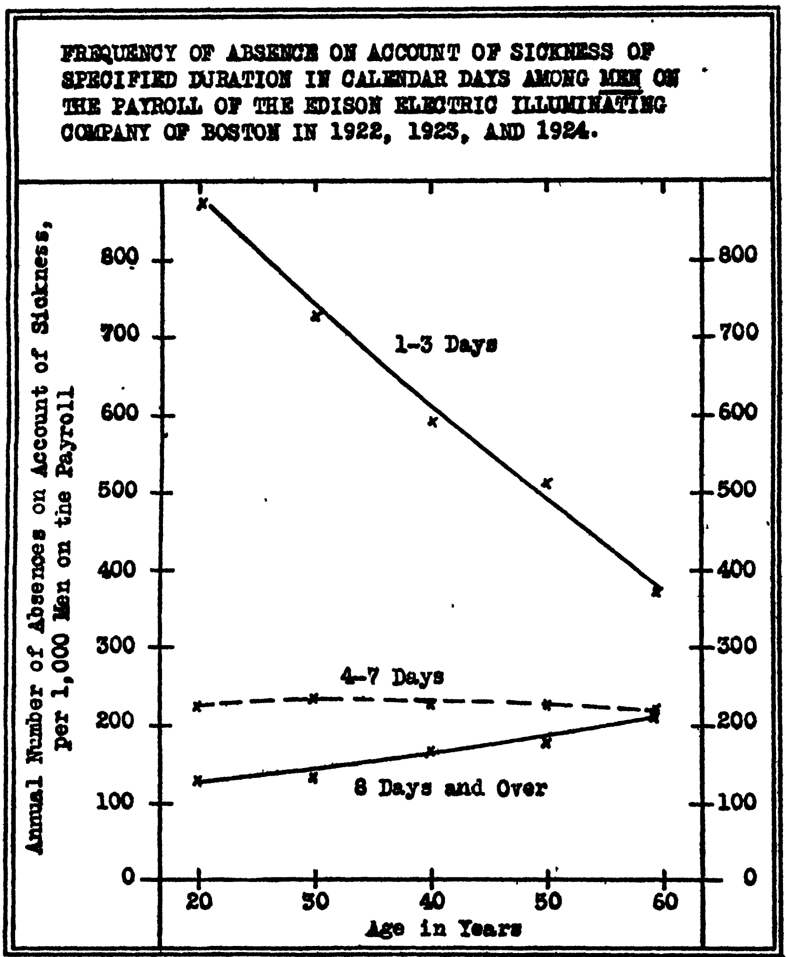

FIG. 2

town, Md., gradually increased from age 20 or thereabouts throughout the remainder of life.[4] It appears, however, that the shape of the age curve of illness depends largely upon the extent to which the more minor sicknesses are included. In early adult life the

[4] The Age Curve of Illness, Hagerstown Morbidity Studies No. IV, Public Health Reports, vol. 42, No. 23 (June 10, 1927), pp. 1565-1576. (Reprint No. 1163.)

frequency of minor illnesses, especially those which disable for a period varying from one to three days, evidently is high, if the experience of male employees of the Edison Co. is typical. In the Hagerstown study it was found by actual check that many minor cases, the one and two day disabilities especially, were not reported for school children,[5] and therefore probably were not generally reported among the adults. The recorded morbidity experience of males in the employ of the Edison Co. showed a practically stationary rate of absence throughout the working period of life from illness lasting four to seven days. The eight-day or longer disabilities, however, increased in frequency from age 20 onward.

TABLE 1.—*Frequency of absence on account of sickness [1] of specified duration according to the age of employees of the Edison Electric Illuminating Co. of Boston in 1922, 1923, and 1924*

Age group	Number of years of life under observation	Annual number of absences per 1,000 on pay roll				Number of absences on account of sickness [1]			
		Duration of disability in calendar days							
		All durations	1-3 days	4-7 days	8 days and over	All durations	1-3 days	4-7 days	8 days and over
All ages	6,129	1,044	666	228	152	6,399	4,084	1,386	929
Under 25	1,310	1,224	872	222	130	1,604	143	291	170
25-34	1,951	1,087	724	233	130	2,121	1,412	454	255
35-44	1,543	980	590	224	166	1,512	910	346	256
45-54	908	911	511	224	176	827	464	203	160
55 and over	417	803	372	220	211	335	155	92	88
All ages	1,508	2,304	1,700	349	255	3,475	2,563		385
Under 25	701	2,536	1,945	364	227	1,778	1,364	255	159
25-34	505	2,442	1,814	351	277	1,233	916	177	140
35-44	204	1,662	1,049	353	260	339	214	72	53
45-54	74	1,297	729	203	365	96	54	15	27
55 and over	24	1,208	625	333	250	29	15		6

[1] Exclusive of accidents of both industrial and nonindustrial origin.

LENGTH OF SERVICE WITH THE COMPANY

Among either sex the frequency of absence from work for 1 day or longer on account of sickness tended to decrease with increase in length of service. Among males in the employ of the company less than 5 years the incidence rate of illness was 56 per cent greater than among those with a service record of 10 years or more. Among

[5] Incidence of Sickness Among White School Children in Hagerstown, Md. Public Health Reports, vol. 40, No. 9 (Feb. 27, 1925), p. 405. (Reprint No. 993, p. 5.)

the women the difference was even wider, those employed by the company less than 5 years being absent on account of illness 72 per cent oftener than the women of 10 or more years' service.

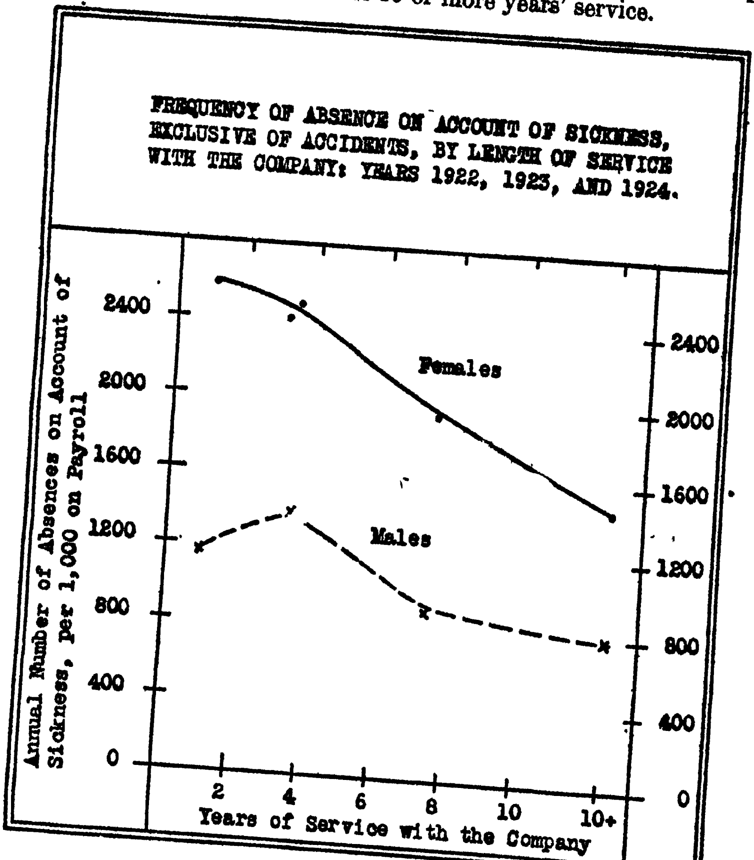

FIG. 3

TABLE 2.—*Frequency of absence on account of sickness, exclusive of accidents, among employees of the Edison Electric Illuminating Co. of Boston during the 3 years ending December 31, 1924: By length of service with the company*

Length of service	Males			Females		
	Number of years of life under observation	Number of absences due to sickness	Rate per 1,000 on the pay roll	Number of years of life under observation	Number of absences due to sickness	Rate per 1,000 on the pay roll
All lengths of service	6,120	6,399	1,044	1,508	3,475	2,304
Less than 2 years	1,928	2,225	1,154	556	1,430	2,572
2 to 5 years	1,183	1,637	1,384	485	1,207	2,489
5 to 10 years	1,469	1,303	887	331	638	1,927
10 years or more	1,549	1,234	797	136	200	1,471

Inasmuch as the trend in the frequency of disabling illness was found to be downward with increase both in age and in length of service, the question arose whether the rates according to length of service merely reflected the influence of age, since the employees of longer service would tend to be in the higher age groups. The frequency of one- to three-day, four- to seven-day, and eight-day or longer disabilities in two service groups (less than five years compared with five or more years' service) was computed, therefore, according to age. The age curves of illness among male employees of five or more years' service did not differ materially from the curves for men of less than five years' service except that disability occurred oftener at every age among the newer recruits than among the veteran employees. The contrast was especially marked in the shorter disabilities; i. e., those lasting less than eight days. Among the women the same results were indicated, although not so clearly, probably because there were only one-fourth as many women as men under observation. It may be said, therefore, that the incidence rates of illness tended to be lower in every age group among employees of five or more years' service than among those who had been with the company less than five years.[6]

TABLE 3.—*Number of years of life covered in the record, classified according to age and by length of service, among men on the pay roll of the Edison Electric Illuminating Co., of Boston, in the three years ending December 31, 1924*

Age group	All periods of service	Less than 5 years in employ of company	5 or more years' service with company
All ages	6,129	3,111	3,018
Under 25	1,310	1,218	92
25-34	1,951	1,139	812
35-44	1,543	455	1,0
45-54	908	249	659
55 and over	417	50	367

[6] Decrease in sickness frequency with increase in length of service is also revealed in other industrial morbidity data collected by the Public Health Service, but not yet published, and in "Disabling Sickness Among Employees of a Rubber Manufacturing Establishment in 1918, 1919, and 1920." Public Health Reports, vol. 37, No. 50 (Dec. 15, 1922). p. 3089. (Reprint No. 804, p. 9.)

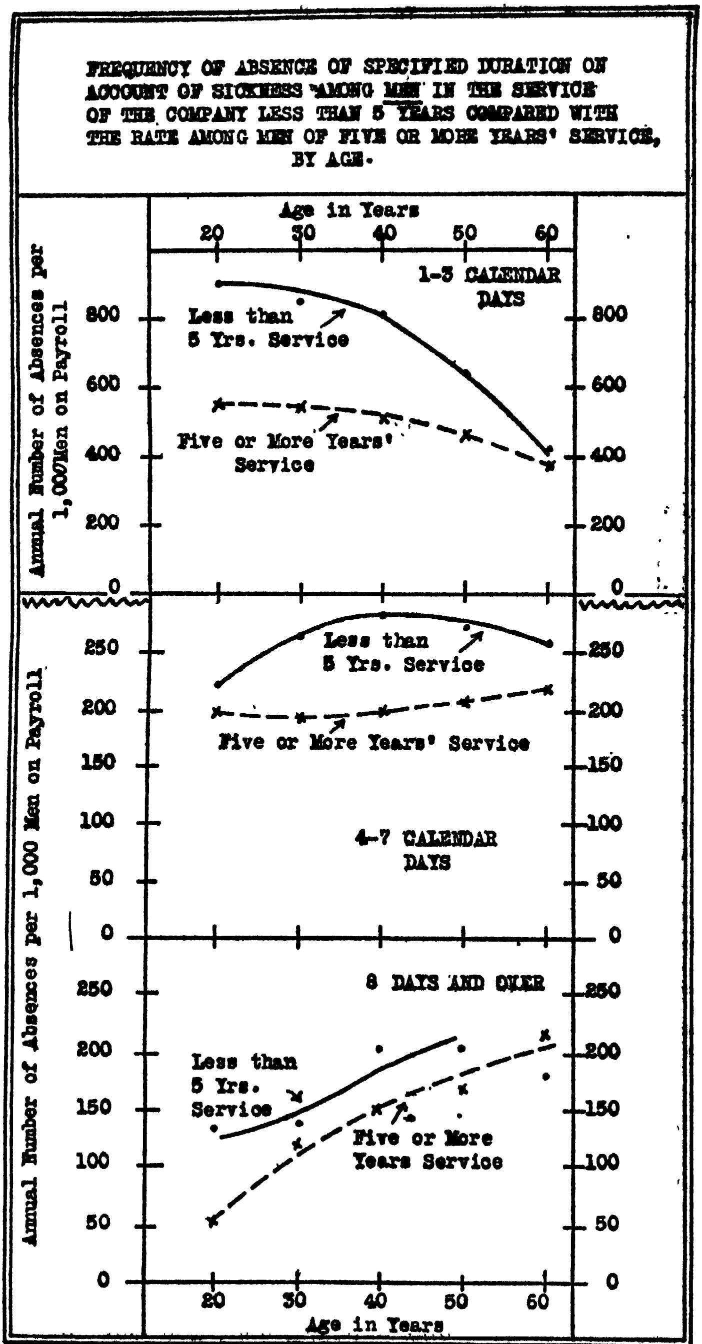
FREQUENCY OF ABSENCE OF SPECIFIED DURATION ON ACCOUNT OF SICKNESS AMONG MEN IN THE SERVICE OF THE COMPANY LESS THAN 5 YEARS COMPARED WITH THE RATE AMONG MEN OF FIVE OR MORE YEARS' SERVICE, BY AGE.
Age in Years
20
30
40
50
60
1-3 CALENDAR DAYS
Annual Number of Absences per 1,000 Men on Payroll
800
600
400
200
0
Less than 5 Yrs. Service
Five or More Years' Service
250
200
150
100
50
0
Less than 5 Yrs. Service
Five or More Years' Service
4-7 CALENDAR DAYS
Annual Number of Absences per 1,000 Men on Payroll
8 DAYS AND OVER
Less than 5 Yrs. Service
Five or More Years Service
Age in Years

FIG. 4

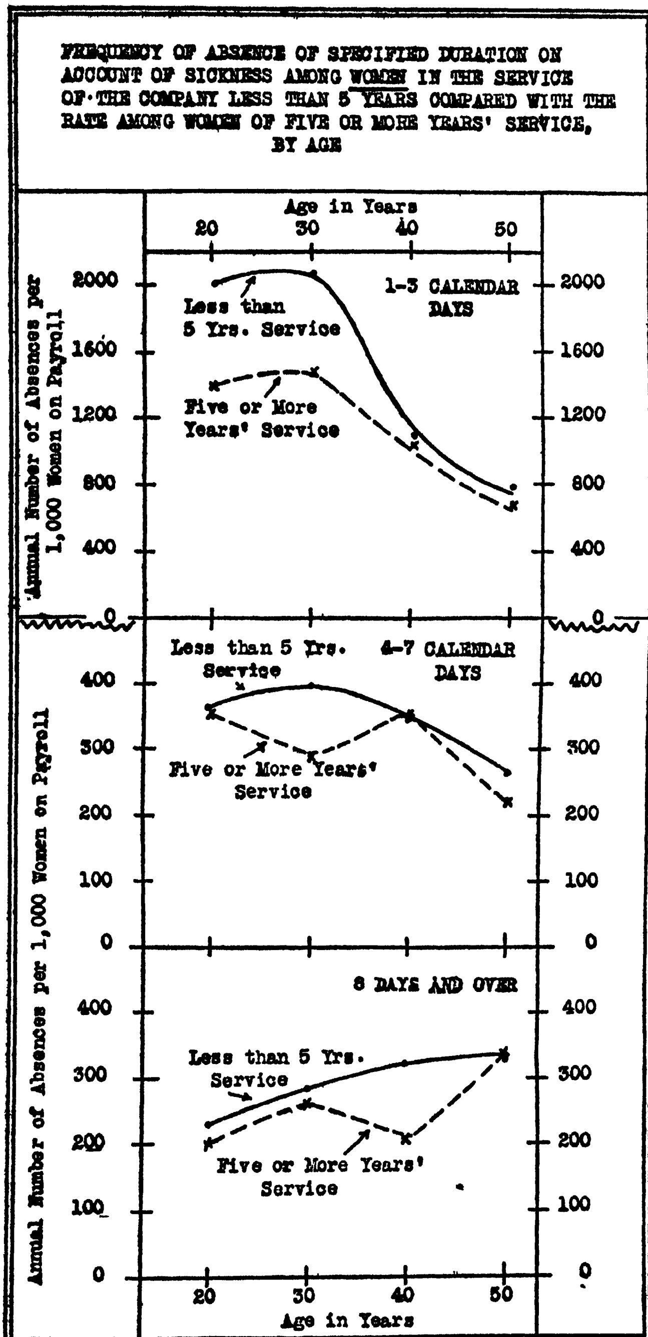
FREQUENCY OF ABSENCE OF SPECIFIED DURATION ON ACCOUNT OF SICKNESS AMONG WOMEN IN THE SERVICE OF THE COMPANY LESS THAN 5 YEARS COMPARED WITH THE RATE AMONG WOMEN OF FIVE OR MORE YEARS' SERVICE, BY AGE
Age in Years
20
30
40
50
Annual Number of Absences per 1,000 Women on Payroll
2000
1600
1200
800
400
0
1-3 CALENDAR DAYS
Less than 5 Yrs. Service
Five or More Years' Service
400
300
200
100
0
4-7 CALENDAR DAYS
Less than 5 Yrs. Service
Five or More Years' Service
Annual Number of Absences per 1,000 Women on Payroll
8 DAYS AND OVER
Less than 5 Yrs. Service
Five or More Years' Service
400
300
200
100
0
20
30
40
50
Age in Years

FIG 5

Table 4.—*Frequency of absence of specified duration on account of sickness*[1] *among men in the service of the company less than five years compared with men of five or more years' service—Morbidity record for three years ending December 31, 1924*

Age group	Annual number of absences per 1,000 men on pay roll: Less than 5 years in employ of company	Annual number of absences per 1,000 men on pay roll: 5 or more years' service with company	Number of absences on account of sickness: Less than 5 years in employ of company	Number of absences on account of sickness: 5 or more years' service with company
DISABILITIES LASTING 1 DAY OR LONGER				
All ages	1,241	841	3,862	2,537
Under 25	1,236	804	1,530	74
25–34	1,252	856	1,426	695
35–44	1,290	850	587	925
45–54	1,108	836	276	551
55 and over	860	795	43	292
DISABILITIES LASTING 1 TO 3 CALENDAR DAYS				
All ages	837	490	2,605	1,479
Under 25	897	554	1,092	51
25–34	851	546	969	443
35–44	802	501	365	545
45–54	634	464	158	306
55 and over	420	365	21	134
DISABILITIES LASTING 4 TO 7 CALENDAR DAYS				
All ages	251	201	781	605
Under 25	224	196	273	18
25–34	262	191	299	155
35–44	284	199	129	217
45–54	269	206	67	136
55 and over	260	215	13	79
DISABILITIES LASTING 8 DAYS OR MORE				
All ages	153	150	476	453
Under 25	135	54	165	5
25–34	139	119	158	97
35–44	204	150	93	163
45–54	205	166	51	109
55 and over	180	215	9	79

[1] Exclusive of accidents.

Table 5.—*Number of years of life covered in the record, classified according to age and by length of service, among women on the pay roll of the Edison Electric Illuminating Co. of Boston, in the three years ending December 31, 1924*

Age group	All periods of service	Less than 5 years in employ of company	5 or more years' service with company
All ages	1,508	1,041	467
Under 25	701	624	77
25–34	505	295	210
35–44	204	92	112
45 and over	98	30	68

TABLE 6.—*Frequency of absence of specified duration on account of sickness*[1] *among women in the service of the company less than five years compared with women of five or more years' service—Morbidity record for the three years ending December 31, 1924*

Age group	Annual number of absences per 1,000 women on pay roll		Number of absences on account of sickness	
	Less than 5 years in employ of company	5 or more years' service with company	Less than 5 years in employ of company	5 or more years' service with company
DISABILITIES LASTING 1 DAY OR LONGER				
All ages	2,533	1,794	2,637	838
Under 25	2,607	1,961	1,627	151
25-34	2,736	2,029	807	426
35-44	1,761	1,580	162	177
45 and over	1,367	1,235	41	84
DISABILITIES LASTING 1 TO 3 CALENDAR DAYS				
All ages	1,907	1,238	1,985	578
Under 25	2,013	1,402	1,256	108
25-34	2,054	1,476	606	310
35-44	1,087	1,018	100	114
45 and over	767	676	23	46
DISABILITIES LASTING 4 TO 7 CALENDAR DAYS				
All ages	370	304	385	142
Under 25	365	351	228	27
25-34	397	286	117	60
35-44	348	357	32	40
45 and over	267	221	8	15
DISABILITIES LASTING 8 DAYS OR LONGER				
All ages	256	252	267	118
Under 25	229	208	143	16
25-34	285	267	84	56
35-44	326	205	30	23
45 and over	333	338	10	23

[1] Exclusive of accidents.

INCIDENCE RATES OF ILLNESS IN DIFFERENT OCCUPATIONS

In Table 7 the annual number of absences due to sickness per 1,000 persons under observation is shown according to occupation. The frequency of one- to three-day, four- to seven-day, and eight-day or longer illnesses is also given to indicate the comparative severity of sickness among persons in different lines of work. The occupations have been arrayed in accordance with the magnitude of the sickness incidence rate (regardless of the duration of disability) for each occupation.

In the interpretation of these rates several points should be borne in mind. Although the chief interest of statistics of this sort lies in

their instructiveness with regard to the effect upon health of different kinds of work and working conditions, the existence of an occupational health hazard is not necessarily indicated by a high rate of illness. The rate merely states the frequency of sickness among persons following a given occupation. The more arduous occupations are of necessity recruited from men of supernormal physical condition. Persons physically unfit for the more exacting occupations and those especially susceptible to certain diseases naturally seek the light, sedentary jobs.[7] However, when the work is not of such a nature as to attract physically inferior individuals in the industrial population, and when the sex and age distribution of the groups under study do not account for the amount of illness experienced, a high sickness rate *may* indicate a causal relation between the occupation and the abnormal number of disabilities.

A factor which probably affects the incidence rate to some extent, especially the frequency of the one- to three-day absences, is the nature of the duties in the different occupations. A telephone operator, for example, is virtually compelled to lay off when suffering from almost any type of minor respiratory illness on account of its effect upon the voice and ears; but under ordinary circumstances such minor pathological conditions would not seriously interfere with the duties of the station operators, for example. This may at least partly explain why the rate of one- to three-day absences on account of sickness among the male telephone operators was 42 per cent above that of the male station operators. In general, however, the effect of these differences undoubtedly is minimized by the payment of full wages during illness, which removes the economic argument for attempting to carry on while suffering a physical indisposition.

It will be seen from Table 7 that the occupation having the worst morbidity experience among the men during the three years ending with 1924 was that of repairmen. Their illnesses of less than four days' duration occurred at an inordinate frequency, and their rate of 4 to 7 and of 8-day or longer cases was considerably higher than the average for all men in the employ of the company. About three-fourths of the men in this group are automobile repairmen on night duty in garages, engaged in repairing cars which are needed during the daytine.

Next to the highest male rate of disabling sickness was shown for the stock handlers; but on account of the small number of years of life under observation (56) the high rate for this occupation may have been due largely to chance. When the numbers are small, it

[7] This type of selection appears to be the principal explanation of the low morbidity rates among steel workers shown in "Sickness Among Industrial Employees," Public Health Reports, vol. 41, No. 4 (Jan. 22, 1926) (Reprint No. 1060), and a considerable factor in the relatively high disability rates among certain textile workers indicated from data now being collected by the Public Health Service.

is necessary to ascertain whether a high rate is sustained over a longer period.

The third from the worst morbidity rate occurred among the linemen. The frequency of eight-day or longer cases among them was not excessive, however, their high rate resulting largely from an abnormal number of disabilities of less than a week's duration. Oilmen and oilers, chauffeurs, and meter testers also appear to have experienced considerably more than the average sickness frequency among men in the employ of the company.

TABLE 7.—*Frequency of absence on account of sickness, exclusive of accidents, by occupations—Recorded morbidity experience of employees of the Edison Electric Illuminating Co. of Boston for the three years ending December 31, 1924*

Occupations	Number of years of life under observation	Annual number of absences due to sickness per 1,000 on the pay roll				Number of absences causing disability for—			
		All calendar days	1–3 days [1]	4–7 days [1]	8 days or more [1]	All calendar days	1–3 days [1]	4–7 days [1]	8 days or more [1]
MALES									
All occupations	6,129	1,044	666	226	152	6,399	4,084	1,386	929
(1) Repairmen	204	2,260	1,598	392	270	461	326	80	55
(2) Stock handlers	56	1,714	1,018	393	303	96	57	22	17
(3) Linemen	286	1,703	1,168	371	164	487	334	106	47
(4) Oilmen and oilers	148	1,642	1,034	399	209	243	153	59	31
(5) Water tenders	63	1,571	1,095	349	127	99	69	22	8
(6) Chauffeurs	146	1,534	918	370	246	224	134	54	36
(7) Meter testers	194	1,404	959	247	258	284	185	48	50
(8) Janitors	54	1,315	759	259	297	71	41	14	16
(9) Firemen	210	1,201	722	324	155	263	158	71	34
(10) Clerks	749	1,096	756	204	136	821	566	153	102
(11) Inspectors	398	1,088	761	199	128	433	303	79	51
(12) Laborers	198	1,071	475	288	308	212	94	57	61
(13) Installers	191	1,026	539	283	204	196	103	54	89
(14) Testmen	70	943	600	157	186	66	42	11	13
(15) Meter readers	134	858	515	224	119	115	69	30	16
(16) Draftsmen	105	829	629	133	67	87	66	14	7
(17) Troublemen	124	726	331	242	153	90	41	30	19
(18) Switchmen	65	708	293	169	246	46	19	11	16
(19) Salesmen	209	689	445	148	96	144	93	31	20
(20) Telephone operators	72	667	514	125	28	48	37	9	2
(21) Station operators	762	618	362	142	114	471	276	108	87
(22) Division heads [2]	250	532	320	124	88	133	80	31	22
(23) Engineers	225	276	147	62	67	62	33	14	15
All other occupations	1,207	1,033	666	230	137	1,247	804	278	165
FEMALES									
All occupations	1,508	2,304	1,700	349	255	3,475	2,563	527	385
(1) Clerks	1,112	2,617	1,970	377	270	2,910	2,191	419	300
(2) Telephone operators	47	1,766	1,128	447	191	83	53	21	9
(3) Stenographers [3]	130	1,408	1,031	200	177	183	134	26	23
(4) Scrubwomen	44	1,386	545	386	455	61	24	17	20
All other occupations	175	1,360	920	251	189	238	161	44	33

[1] Duration of disability is measured in terms of the number of calendar days intervening between the date absence began and the date employee returned to work.
[2] Also their assistants and subassistants.
[3] Also typists and dictophone operators.

The frequency of the longer cases, i. e., those lasting eight days or more, was greatest among the laborers. In unskilled work, such as that of the general laborer, operation of the selective tendencies mentioned above may be especially expected. Into such work naturally drift those persons who through diminished physical or mental health find themselves unable to engage in more exacting occupations. Another group which might be overloaded with individuals below par physically are the clerks. The wide differences in sickness frequency of the male engineers, division heads, their assistants and subassistants compared with the male clerks *may* roughly measure the effect of this factor. Very interesting also is the fact that the rate of absence on account of sickness among the female clerks was 85 per cent above that of the female stenographers, typists, and dictophone operators.

DISEASE GROUPS CAUSING DISABILITY IN DIFFERENT OCCUPATIONS

In order to facilitate the study of possible occupational influences, the sickness record of persons in several of the occupations which were believed to be free from any health hazard of consequence was used as a control. Among the men the following occupations were selected for this purpose: Clerks, division heads, their assistants and subassistants, draftsmen, engineers, and salesmen; and among the women, on account of the limited selection, the record merely of the stenographers, typists, and dictophone operators. For each of the remaining occupations included in the list presented in Table 7 the number of one-day or longer absences occasioned by different disease groups is shown in Tables 8 and 9, in comparison with the number of absences from causes specified which occurred among an equal number of persons in the control group. In Table 11 the difference between the actual number of absences and the number expected from the experience of the control group was expressed in terms of the ratio of actual to expected number of absences, the ratio being 100 when the rate for the occupation was the same as in the control group.

TABLE 8.—*Number of absences on account of disease groups specified, and number expected from the sickness rates of a control group[1] among male employees of the Edison Electric Illuminating Co. of Boston in 1922, 1923, and 1924*

Actual and expected number of absences	Sickness, exclusive of accidents	Respiratory diseases [2]	Diseases of the digestive system [3]	Diseases of the nervous system [4]	Diseases of the circulatory and genito-urinary systems [5]	Diseases of the skin [6]	Rheumatism [7]	All other diseases
REPAIRMEN								
Actual	461	227	119	25	11	19	34	26
Expected	165	105	33	6	4	5	4	8
STOCK HANDLERS								
Actual	96	56	18	5	1	3	11	2
Expected	45	29	9	2	1	1	1	2
LINEMEN								
Actual	487	318	99	12	6	8	27	17
Expected	232	148	46	9	5	7	5	12
OILMEN AND OILERS								
Actual	243	128	64	13	5	6	13	14
Expected	120	76	24	4	3	4	3	6
WATER TENDERS								
Actual	99	46	29	3	5	6	7	3
Expected	51	32	10	2	1	2	1	3
CHAUFFEURS								
Actual	224	118	46	14	5	16	11	14
Expected	118	75	23	4	3	4	3	6
METER TESTERS								
Actual	284	173	67	7	3	4	11	19
Expected	157	100	31	6	3	5	4	8
JANITORS								
Actual	71	38	17	3	1	2	8	2
Expected	44	28	9	2	1	1	1	2
FIREMEN								
Actual	263	134	66	13	5	7	26	12
Expected	178	113	35	7	4	6	4	9

[1] The following occupations were included in the control group. Clerks, division heads, their assistants and subassistants, draftsmen, engineers, and salesmen.
[2] Title numbers 11, 31, 97–107, and 109 in the International List of the Causes of Death, third revision, Paris, 1920.
[3] Title numbers 108, 110–127 in the International List
[4] Title numbers 70–84 in the International List.
[5] Title numbers 87–96 and 128–134 in the International List.
[6] Title numbers 151–154 in the International List.
[7] Title numbers 51–52 in the International List.

TABLE 8.—*Number of absences on account of disease groups specified, and number expected from the sickness rates of a control group among male employees of the Edison Electric Illuminating Co. of Boston in 1922, 1923, and 1924*—Contd.

Actual and expected number of absences	Sickness, exclusive of accidents	Respiratory diseases	Diseases of the digestive system	Diseases of the nervous system	Diseases of the circulatory and genito-urinary systems	Diseases of the skin	Rheumatism	All other diseases
INSPECTORS								
Actual	433	274	89	29	5	10	8	18
Expected	323	205	64	13	7	10	7	17
LABORERS								
Actual	212	133	30	6	2	3	26	12
Expected	161	102	32	6	4	5	4	8
INSTALLERS								
Actual	196	115	42	8	4	7	8	12
Expected	155	90	31	6	3	5	3	8
TESTMEN								
Actual	66	44	10	1	0	3	3	5
Expected	57	36	12	2	1	2	1	3
METER READERS								
Actual	115	64	33	3	1	5	2	7
Expected	109	60	22	4	3	3	2	6
TROUBLEMEN								
Actual	90	54	22	2	2	2	5	3
Expected	100	64	20	4	2	3	2	5
SWITCHMEN								
Actual	46	22	14	2	1	0	3	4
Expected	53	34	10	2	1	2	1	3
TELEPHONE OPERATORS								
Actual	48	31	10	3	0	1	0	3
Expected	58	37	12	2	1	2	1	3
STATION OPERATORS								
Actual	471	281	128	18	3	4	12	25
Expected	618	393	123	24	14	19	14	31

TABLE 9.—*Number of absences on account of disease groups specified, and number expected from the sickness rates of a control group [1] among female employees of the Edison Electric Illuminating Co. of Boston in 1922, 1923, and 1924*

Actual and expected number of absences	Sickness, exclusive of accidents	Respiratory diseases [2]	Diseases of the digestive system [3]	Diseases of the nervous system [4]	Dysmenorrhea [5]	Rheumatism [6]	All other diseases
CLERKS							
Actual	2,910	1,280	586	309	488	38	209
Expected	1,565	710	393	197	197	8	51
TELEPHONE OPERATORS							
Actual	83	44	20	6	5	0	8
Expected	66	31	17	8	8	0	2
SCRUBWOMEN							
Actual	61	38	9	4	0	4	6
Expected	62	28	16	8	8	0	2

[1] The following occupations were included in the control group: Stenographers, typists, dictophone operators.
[2] Title numbers 11, 31, 97–107, and 109 in the International List of the Causes of Death, third revision, Paris, 1920.
[3] Title numbers 108, 110–127 in the International List.
[4] Title numbers 70–84 in the International List.
[5] Title number 141 in the International List.
[6] Title numbers 51 and 52 in the International List.

In a number of instances the differences are not significant on account of the small numbers which frequently resulted when the disabilities among persons in a given occupation were subdivided according to the nature of the illness. The numbers involved of course have to be considered.

Among the repairmen and linemen, diseases of the digestive system, respiratory diseases, and rheumatism appear to have occurred at excessive frequency. The oilmen and oilers also experienced an abnormal number of digestive and respiratory illnesses. Only six absences on account of skin diseases, however, were reported among these men during the three-year period, although furunculosis (boils) may result from handling oil. Most of the oilmen and oilers, however, are employed in power stations equipped with shower-bath facilities which are used at the close of each tour, at which time the men make a complete change of clothing. This procedure may be sufficient to prevent the development of furunculosis under the amount of exposure to oil which is incident to the duties of the occupation.

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SICKNESS ACCORDING TO LENGTH OF SERVICE IN DIFFERENT OCCUPATIONS

In the occupations exhibiting high disability rates, a question of interest is whether the excess in sickness occurred among the newer employees or among those who had been with the company for a considerable period. The latter may be expected to be a more selected group, inasmuch as persons ill-suited physically to the conditions of work in a given occupation tend to quit.[8] Hence an inordinate rate of sickness among employees of five or more years' service may be of greater significance from an occupational standpoint than a high rate of illness among the new recruits.

In measuring the sickness in these two groups, the number of absences on account of illness among persons who had been engaged in the occupation specified for less than five years was compared with the number of absences expected from the average rate of sickness among men of less than five years' service in the control group, and the ratio of actual to expected number of absences was computed. Similarly, the number of disabilities according to occupation among those of five or more years' service was compared with the number expected from the rate of sickness among men in the same service group in the occupations used as a control, and the ratio of actual to expected number ascertained. The higher ratio, of course, indicated which of the two service groups within the occupation experienced the greater excess in sickness frequency.

In order to obtain the equivalent number of persons under observation for one full year (years of life) during the three-year period in these two service groups, the distribution of persons on the pay roll as of July 15, 1923, according to the number of years employed by the company, was obtained according to occupation, as previously explained, and the percentage in each service group applied to the years of life in each occupation. The pay-roll distribution and the derived number of years of life in the two service groups are shown in Table 10.

[8] This tendency is indicated in morbidity data for a group of cement workers presented in "The Health of Workers in Dusty Trades, I. Exposure to Dust and Other Conditions in a Portland Cement Plant. Public Health Bulletin No. 176, U. S. Public Health Service. In press.

Table 10.—*Estimated number of years of life under observation in occupations specified during the three years ending December 31, 1924, according to number of years employed by the Edison Electric Illuminating Co. of Boston*

Occupations	Years of life under observation			Sample distribution of number on pay roll as of July 15, 1923		
	Years of service with the company					
	All lengths of service	Less than 5	5 or more	All lengths of service	Less than 5	5 or more
MALES						
All occupations	6,129	3,111	3,018	2,073	1,052	1,021
Control group [1]	1,538	813	725	537	284	253
Repairmen	204	150	54	79	58	21
Stock handlers	56	40	16	21	15	6
Linemen	286	230	56	103	83	20
Oilmen and oilers	148	89	59	55	33	22
Water tenders	63	21	42	24	8	16
Chauffeurs	146	63	83	49	21	28
Meter testers	194	118	76	66	40	26
Janitors	54	36	18	15	10	5
Firemen	219	124	95	69	39	30
Inspectors	398	200	198	137	69	68
Laborers	198	149	49	60	45	15
Installers	191	72	119	56	21	35
Testmen	70	57	13	26	21	5
Meter readers	134	97	37	47	31	13
Troublemen	124	7	117	35	2	33
Switchmen	65	28	37	21	9	12
Telephone operators	72	34	38	23	11	12
Station operators	762	210	552	258	71	187
All other occupations	1,207	573	634	392	178	214
FEMALES						
All occupations	1,508	1,041	467	510	352	158
Control group [2]	130	82	48	38	24	14
Clerks	1,112	828	284	384	286	98
Telephone operators	47	9	38	15	3	12
Scrubwomen	44	22	22	12	6	6
All other occupations	175	100	75	61	33	28

[1] Clerks, division heads, their assistants and subassistants, draftsmen, engineers, and salesmen.
[2] Stenographers, typists, and dictophone operators.

Occupations in which men of five or more years' service experienced more excessive disability rates than employees of less than five years' service, both in respiratory and in nonrespiratory diseases, were repairmen, oilmen and oilers, stock handlers, chauffeurs, laborers, and water tenders. The linemen of longer service had a considerably higher excess disablement rate from the nonrespiratory diseases than those employed less than five years, but in diseases of the respiratory system the ratio of actual to expected number of absences was about the same in either length-of-service group. The number of disabilities in excess of the expected number showed small differences according to length of service among the meter testers, janitors, and firemen.

TABLE 11.—*Number of absences on account of sickness in certain occupations among men of less than five years' service compared with five or more years in the company's service, and the number of absences expected from the sickness rates of the control group*[1]*: Years 1922, 1923, and 1924*

Actual and expected number of absences	Sickness, exclusive of accidents		Respiratory diseases[2]		Nonrespiratory diseases	
	Years of service with the company					
	Less than 5	5 or more	Less than 5	5 or more	Less than 5	5 or more
REPAIRMEN						
Actual	346	115	156	71	190	44
Expected	146	34	92	22	54	12
Ratio[3]	237	338	170	323	352	367
STOCK HANDLERS						
Actual	55	41	30	26	25	15
Expected	39	10	25	6	14	4
Ratio[3]	141	410	120	433	179	375
LINEMEN						
Actual	407	80	275	43	132	37
Expected	223	35	141	23	82	12
Ratio[3]	183	229	195	187	161	308
OILMEN AND OILERS						
Actual	153	90	86	42	67	48
Expected	86	37	54	24	32	13
Ratio[3]	178	243	159	175	209	369
WATER TENDERS						
Actual	25	74	13	33	12	41
Expected	20	27	13	17	7	10
Ratio[3]	225	274	100	194	171	410
CHAUFFEURS						
Actual	66	158	32	86	34	72
Expected	61	52	39	33	22	19
Ratio[3]	108	304	82	261	155	379
METER TESTERS						
Actual	197	87	117	56	80	31
Expected	115	48	73	31	42	17
Ratio[3]	171	181	160	181	190	182

[1] The following occupations were included in the control group: Clerks, division heads, their assistants and subassistants, draftsmen, engineers, and salesmen.
[2] Title numbers 11, 31, 97–107, and 109 in the International List of the Causes of Death, third revision, Paris, 1920.
[3] Ratio of actual to expected number of absences. When the two coincide, ratio = 100.

TABLE 11.—*Number of absences on account of sickness in certain occupations among men of less than five years' service compared with five or more years in the company's service, and the number of absences expected from the sickness rates of the control group: Years 1922, 1923, and 1924*—Continued

Actual and expected number of absences	Sickness, exclusive of accidents		Respiratory diseases		Nonrespiratory diseases	
	Years of service with the company					
	Less than 5	5 or more	Less than 5	5 or more	Less than 5	5 or more
JANITORS						
Actual	55	16	28	10	27	6
Expected	35	11	22	7	13	4
Ratio [1]	157	145	127	143	208	150
FIREMEN						
Actual	170	93	93	41	77	52
Expected	120	60	76	39	44	21
Ratio [1]	142	155	122	105	175	248
INSPECTORS						
Actual	244	189	144	130	100	59
Expected	194	125	123	80	71	45
Ratio [1]	126	151	117	163	141	131
LABORERS						
Actual	153	59	93	40	60	19
Expected	145	31	92	20	53	11
Ratio [1]	106	190	101	200	113	173
INSTALLERS						
Actual	98	98	61	54	37	44
Expected	70	75	44	48	26	27
Ratio [1]	140	131	139	113	142	163

[1] Ratio of actual to expected number of absences. When the two coincide, ratio = 100.

Inasmuch as the frequency of illnesses of one day or longer did not show much variation according to age among the male employees of the company as a whole (*cf.* Fig. 1), it was deemed unnecessary to present the sickness rates according to occupation with the age factor eliminated. The age distribution of the personnel of certain occupations differed somewhat from that of the control group, as shown in Table 12, but it was found that in no occupation among the men did adjustment for differences in age distribution affect the rate as much as 16 per cent.

TABLE 12.—*Age distributions of employees of the Edison Electric Illuminating Co. of Boston, by occupations, as of July 15, 1923*

Occupations	Per cent			Number of persons			
	Under 25	25-44	45 and over	Total	Under 25	25-44	45 and over
All occupations	21	57	22	2,073	443	1,182	448
Control group [1]	26	56	18	537	139	301	97
Repairmen	32	54	14	79	25	43	11
Linemen	28	59	13	103	29	61	13
Oilmen and oilers	13	71	16	55	7	39	9
Water tenders	0	67	33	24	0	16	8
Stock handlers	19	67	14	21	4	14	3
Chauffeurs	4	82	14	49	2	40	7
Meter testers	44	47	9	66	29	31	6
Janitors	7	40	53	15	1	6	8
Firemen	3	71	26	69	2	49	18
Inspectors	34	42	24	137	47	58	32
Laborers	10	63	27	60	6	38	16
Installers	14	66	20	56	8	37	11
Testmen	34	58	8	26	9	15	2
Meter readers	34	64	2	47	16	30	1
Telephone operators	39	52	9	23	9	12	2
Switchmen	14	57	29	21	3	12	6
Troublemen	0	71	29	35	0	25	10
Station operators	14	65	21	258	35	168	55
All other occupations	18	48	34	392	72	187	133
All occupations	46	47	7	510	237	240	33
Control group [2]	45	39	16	38	17	15	6
Clerks	55	43	2	384	210	166	8
Telephone operators	7	86	7	15	1	13	1
Scrubwomen	0	50	50	12	0	6	6
All other occupations	15	65	20	61	9	40	12

[1] Clerks, division heads, their assistants and subassistants, draftsmen, engineers, and salesmen.
[2] Stenographers, typists, and dictophone operators.

CORRELATION OF INDUSTRIAL AND NONINDUSTRIAL ACCIDENTS AMONG THE MEN

In Table 13 the frequency of industrial accidents causing disability for one day or longer is compared with the nonindustrial accident rate, by occupations, among the male employees of the company. Industrial injuries should properly be stated in terms of the number of hours of exposure (man-hours), but in the absence of wide differences in the weekly work schedule of persons in the occupations listed, the rates as shown may be sufficiently correct for comparison with the frequency of nonindustrial injuries among the same groups of workers.

TABLE 13.—*Frequency of absence on account of industrial accidents compared with nonindustrial accidents, by occupations, among male employees of the Edison Electric Illuminating Co. of Boston in 1922, 1923, and 1924*

Occupations among male employees	Number of years of life under observation	Annual rate per 1,000 men on pay roll		Number of absences	
		Industrial accidents	Nonindustrial accidents	Industrial accidents	Nonindustrial accidents
All occupations	6,129	79	75	486	457
(1) Linemen	286	297	119	85	34
(2) Laborers	198	227	45	45	9
(3) Repairmen	204	152	167	31	34
(4) Troublemen	124	145	65	18	8
(5) Water tenders	63	143	95	9	6
(6) Chauffeurs	146	137	164	20	24
(7) Testmen	70	129	157	9	11
(8) Firemen	219	128	114	28	25
(9) Meter readers	134	127	60	17	8
(10) Occupations other than those named	1,207	120	77	145	93
(11) Meter testers	194	57	113	11	22
(12) Janitors	54	56	111	3	6
(13) Oilmen and oilers	148	54	101	8	15
(14) Stock handlers	56	54	107	3	6
(15) Installers	191	52	73	10	14
(16) Switchmen	65	31	108	2	7
(17) Salesmen	209	24	33	5	7
(18) Station operators	762	22	51	17	39
(19) Engineers	225	18	22	4	5
(20) Clerks	749	15	49	11	37
(21) Inspectors	398	13	63	5	25
(22) Division heads	250	0	48	0	12
(23) Draftsmen	105	0	86	0	9
(24) Telephone operators	72	0	14	0	1

For the purpose of ascertaining whether the nonindustrial accident rate varied or did not vary in accordance with the industrial accident rate, the coefficient of correlation was computed. A coefficient of 0.432 ± 0.112 was obtained, indicative to a fairly definite extent, of the existence of a relationship between the two sets of accident rates. A cause which suggests itself as being common to both is the personal factor in accidents, to which attention has in recent years been increasingly directed.[9] This is not to say that the nature of the accident hazard in any given occupation may not still largely determine the number of injuries occurring to persons following the occupation.

ACKNOWLEDGMENTS

The Edison Electric Illuminating Co. of Boston not only made their disability records available for study, but assisted generously in the tabulation and analysis of the data. To Mr. Herbert W. Moses, superintendent employment bureau, we are especially indebted for his cooperation and advice.

[9] The question of differing individual liability to accidents under uniform conditions of risk has been treated statistically by Major Greenwood and Hilda M. Woods in Report No. 4 of the Industrial Fatigue Research Board of Great Britain, in "A Report on the Incidence of Industrial Accidents upon Individuals, with Special Reference to Multiple Accidents," and by Ethel M. Newbold in "Practical Applications of the Statistics of Repeated Events, Particularly to Industrial Accidents," in Journ. Royal Statistical Society Vol. XC, Part III, 1927, London, England.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Two Years' Operation of the Sewage Treatment Plant at Worcester Mass. R. S. Lamphear. *Journal Boston Society of Civil Engineers*, vol. 14, No. 8, October, 1927, p. 450. (Abstract by H. D. Cashmore.)

Sewage has been treated since 1890 with marked success at Worcester. Advancements in treatment of sewage and recognition of the shortcomings of the old plant resulted in the construction of a new $3,800,000 plant, which was put in service in June, 1925.

The sewage from 235,000 people is treated in addition to storm sewage which is taken in from 35 per cent of the system. The plant is designed for a daily average of 28 million gallons, or an estimated population of 242,000 in 1939. Great fluctuation in volume is due to storms, but the system has been found capable of handling any amount. A great amount of industrial wastes is also handled.

The system consists of two large grit chambers which remove 4 cubic feet of material per million gallons of sewage, two bar screens at the outlet end of the grit chambers, 12 Imhoff tanks, each having a capacity in the sedimentation chamber and sludge compartment of 1.34 and 2.54 cubic feet, respectively, 4 pairs of dosing tanks, 4 units of trickling filters comprising 13.68 acres, 4 secondary settling tanks 60 by 120 feet in size, and 23 sludge drying beds which were formerly the old intermittent sand filters of 1 acre area each.

In 1926 the total cost of treatment of sewage averaged $7.37 per million gallons. In general, the plant works very well, but certain improvements can be made in the details which will increase the efficiency to some extent.

Progress on Cooperation with Ohio Manufactures in Proper Disposal of Industrial Wastes. F. H. Waring. Sixth Annual Report of Ohio Conference on Water Purification, 1926, pp. 60–63. (Abstract by R. E. Tarbett.)

Seventy-five filtration plants serving over half of the population of the State make control of stream pollution particularly important in Ohio. A stream pollution law and a sewer rental law have furnished the necessary remedial legislation. Plans for correcting industrial waste pollution have been developed through cooperation with manufacturers taken in groups according to the character of wastes produced.

The article covers the various groups that have been organized and the progress made by each. These groups at present include the by-product coke industry, the paper manufacturers, the milk and dairy industry, the canning industry. Many of these are not confining their activities to Ohio alone.

At present Ohio, Pennsylvania, West Virginia, Kentucky, Maryland, and New York are bound together in an agreement of uniform policies relative to interstate stream conservation, and Indiana, Illinois, and Tennessee have signified their desire to join the group.

Phenol Wastes in Ohio River Watershed. E. S. Tisdale. *Water Works*, vol. 66, No. 7, July, 1927, pp. 284–285. (Abstract by Arthur P. Miller.)

This article outlines the steps taken by States on the Ohio River Basin to eliminate phenolic and other tarry substances from the river and discusses the further cooperative agreements between those States which culminated in the Board of Public Health Engineers of the Ohio River Basin.

Nauseating medicinal tastes in Cleveland's public water supply in 1922 necessitated action on the part of the Ohio health authorities. At the request of the Ohio State Department of Health the United States Public Health Service in May, 1923, called a phenol conference in Washington to take testimony and evaluate this problem from a national standpoint. One month later the by-product coke companies met with that State health department and agreed

upon a policy to keep phenolic wastes out of Ohio streams. In January, 1924, at another conference called by the United States Public Health Service, an organization of States on the Ohio River watershed was effected. Following this meeting an engineer of the Public Health Service was detailed to make a study of the extent of phenol waste pollution.

In April, 1924, a meeting was held in Pittsburgh, where several State health departments and executives of all by-product coke manufacturers met to hear and discuss the Public Health Service report and to formulate policies for the cooperating States to carry out, working with the industries. In November, 1924, the State health departments of Pennsylvania, Ohio, and West Virginia entered into an interstate stream agreement with respect to phenol waste disposal. Kentucky later became a signatory to this agreement. In April, 1927, a survey by the respective State health departments showed that phenol discharges in the rivers had been greatly reduced and that complete elimination would soon be in effect. This cooperative effort between States led to the organization of the Board of Public Health Engineers of the Ohio River Basin.

Sewage Farm Covers 13,602 Acres. Anon. *Engineering News-Record*, vol. 99, No. 17, October 27, 1927, p. 669. (Abstract by A. S. Bedell.)

An abstract of an article in *The Engineer* (London), November 12, 1926, page 519, describing the method of sewage disposal of Melbourne metropolitan area (Victoria, Australia). The land was "originally treeless, almost stoneless, open plain country, somewhat clayey and poorly grassed," having an average annual rainfall of 18.14 inches.

The farm is sown with lucerne, pasture grasses, and clover, and is flooded with sewage and used for raising hay and for grazing. Except in winter or very wet weather, the farm takes 3 inches of sewage every two or three weeks, or 5½ feet per year, 8,084 acres being under irrigation. Dairying is not permitted, but grazing and raising cattle and sheep are carried on. On June 30, 1925, there were 6,671 cattle, 4,947 sheep, and 800 horses, with 200 employees on the farm. Revenue from grazing usually is greater than cost of sewage treatment, aside from capital charges, while in years of drought the revenue meets all charges.

City Sewage Disposal Plant Held to be a Nuisance. Warren J. Scott. *Water Works*, vol. 66, No. 10, October, 1927, p. 422. (Abstract by H. B. Hommon.)

Property owners of the town of Marlin, Tex., living near the sewage disposal plant brought suit against the City of Marlin to restrain the operation and the enlargement of the city's sewage disposal plant and to require the city to move the plant to another locality. The property owners alleged that the plant caused offensive odors and gases to emanate which were detrimental to health and prevented them from occupying their residences with any comfort. The cause was submitted on special issues, and by judgment of the trial court the city was permanently restrained from maintaining its existing sewage disposal plant and enjoined from enlarging it at the place where it was then located and was also required within six months to remove the plant to another place. The trial court's judgment was affirmed by the court of civil appeals, which said: "The evidence shows beyond controversy that the present system is exceedingly offensive to all of the appellees, as well as a large number of other citizens of Marlin * * * We think the evidence is sufficient to support the jury's finding that the proposed plant which the city is preparing to erect will cause the same offensive odors and that the same objections may be urged against it * * * It seems to be the settled law of this State that a city may, the same as a private individual, be restrained from maintaining a nuisance. * * * "

A Small Sewage Works in a Nottinghamshire Colliery District. E. J. Silcock. *Surveyor*, vol. 72, No. 1855, August 12, 1927, pp. 141–143. (Abstract by C. C. Ruchhoft.)

This plant was designed to be constructed in three units, each unit to treat the sewage from a population of 5,000. The first unit has been operating for some time, the second is about to be built, and the third will be built when needed. The plant receives sewage from a partially separate system and was designed for a flow of 20 gallons per capita per day. The detritus and screening chambers are in duplicate and have ample capacity to handle the sewage from a population of 15,000, so that a third installation will not be required. The plant, with the second unit, includes 2 Dortmund type tanks, 4 circular percolating bacteria beds, 2 secondary settling tanks also of the Dortmund type, 2 storm water tanks, 20 sludge dry beds, and a pumping station. The storm water is distributed by means of submerged orifices. One of these passes three times the dry weather flow to the settling tanks, while a second discharges from three to six times the dry weather flow to the storm-water tanks. The surplus flows over a weir to the stream outfall.

Rats, Fleas, and Plague in Japan. (Topi, pulci e peste in Giappone.) Guido Guerrini, Giorn. d. Reale Soc. Ital. d'Igiene. 1927, vol. 44, No. 1. 8 pp. Abstract by H. Harold Scott in *Tropical Diseases Bulletin*, vol. 24, No. 11, November, 1927, p. 933.

"This paper is largely statistical. Nearly half a million rats were examined during the 18 months from February, 1909, to July, 1910 Among this number 0.1 per cent of the *norvegicus* species were found infected with plague, but 1.55 per cent of *alexandrinus*. In Tokyo and Aichi the latter species was positive in 90.48 and 86.9 per cent, respectively; but in Prefecture of Miye *R.* [*M.*] *rattus* was positive in 53.68 per cent, *norvegicus* in 24.23, and *alexandrinus* in 22.09 per cent.

"As regards the fleas, *Ceratophyllus anisus* and *C. fasciatus* were widespread; *Paradoxospyllus curvispinosus*, a species peculiar to Japan, was very frequently met with, especially in Tokyo; *Xenopsylla cheopis* only rarely, in seaports; *Ctenopsylla cuniculi* common everywhere in the country. In Yokohama, among 2,508 fleas, there were 2,276, or 90.7 per cent, *C. anisus* and *P. curvispinosus* and only 9 of *X. cheopis* and *Pulex irritans* combined. Except *X. cheopis* all are most numerous in winter; they increase gradually from September to January, rapidly in January and February, and decrease rapidly in May.

"From examination of fleas caught in Yura all the species were shown to be carriers of plague except *Ceratophyllus felis*."

Residual Germicidal Action of Water Treated with Ultra-Violet Rays. E. C Berndt. *Journal of the American Association for Promoting Hygiene* and *Public Baths*, vol. 9, 1927, pp. 36–38. (Abstract by J. L. Robertson.)

The proper exposure of water to ultra-violet rays destroys bacterial life without adding odor, taste, or irritating qualities to the water. When used in connection with swimming pools, with re-circulating systems the results obtained are far better than the law of purification by consecutive dilution would indicate. According to this law, two turnovers of a pool water per 24 hours would indicate a removal of 63 per cent of the impurities. Tests made using ultra-violet ray sterilization show much better results.

Recent tests made at the Detroit Athletic Club, to determine whether there was any residual germicidal action imparted to water exposed to ultra-violet rays, showed better results with ultra-violet ray treatment than with the method of simple dilution by adding pure city water, although the bathing load was 20 per cent higher at the time when the tests were run on the ultra-violet process.

Recently the United States Bureau of Standards published a report on an investigation of the germicidal action of ultra-violet radiation. The following conclusion of this report is quoted in this article:

"It is important to emphasize that our results, in general, are in agreement with those of recent investigators, showing that the killing of bacteria by ultraviolet rays is not due to the small amounts of toxic chemical substances that may be produced by the action of the rays on the water or other medium."

Swimming Pool Sanitation a Public Health Problem. H. P. Croft. *Journal of the American Association for Promoting Hygiene and Public Baths*, vol. 9, 1927, pp. 34–35 (Abstract by J. L. Robertson.)

That the control of indoor and outdoor swimming pools by health authorities is desirable for the promotion of public health is evidenced by two States having statutory regulations; seven State health departments adopting rules and regulations; eight State health departments acting in an advisory capacity; and eight others preparing or considering the preparation of rules and regulations.

With the increasing popularity of swimming pools in amusement parks, public schools, etc., sanitary control is desirable. The committee on bathing places of the American Public Health Association has put forth tentative regulations. That part of these regulations relating to the bacterial quality of the water was stressed, with the thought that the bacterial content is influenced by all factors entering into the design, operation, and supervision.

California State Board of Health Rules Governing Sanitation, Safety, and Cleanliness of Swimming Pools. Anon. *Journal of the American Association for Promoting Hygiene and Public Baths*, vol. 9, 1927, pp. 65–78. (Abstract by R. E. Tarbett.)

The new rules were adopted in 1926 and cover the bacteriological quality of the pool water, cleanliness of pool water, sanitation of premises, sputum contamination (by requiring a scum gutter), diseased persons, dressing room and sanitary conveniences, safety of bathers, laundry, operating records and report, and application for permit. Notes accompanying the rules cover the question of construction, water supply, and water treatment, including disinfection and copper sulphate treatment.

Under the rules, applications must be made and permits granted by the bureau of sanitary engineering of the State board of health. Where construction is contemplated, a report including detailed plans must be submitted.

An Experiment in Mosquito-Proofing Barracks of British Troops. A. Campbell Munro. *Journal of the Royal Army Medical Corps*, vol. 49, No. 4, October, 1927, pp. 248–255. (Abstract by R. E. Tarbett.)

The article covers experimental screening of certain barracks at Lahore and Amritsar, plains stations in the Lahore Military District, India. These two stations are located in the flat country having poor drainage, and are the most malarious of all the Indian stations.

Antilarval work has been carried on for many years, as has personal protection by the use of mosquito nets, mosquito lotions, fumigations, etc. Not all of the barracks at these two stations were screened. Barracks screened were long, single story, bungalow type, having a veranda 12 feet wide on one side. These verandas were pierced by a series of archways, the only openings to the veranda. A stout wooden framework was made in each archway, covered with brass wire gauze, 16 mesh, over which one-half inch rabbit netting was nailed for protection. Doorways were double screened with a 10-foot screen gangway between the doors. Doors opened outward and were fitted with double springs. Windows were screened on the outside. Fireplaces were temporarily filled with brick during the warm weather and all ventilators covered with wire gauze. One man per barrack room was detailed for the sole duty of keeping screens in good repair. "It was made a court-martial offense to prop a screen door open or to pass a door so propped without removing the obstacle.

In addition to malaria prevention, other advantages were the dispensing with mosquito nets, which allowed the lowering of punkhas, the absence of flies and nonbiting insects as well as pest mosquitoes, and the actual lowering of the temperature in the rooms.

Malaria was as prevalent in the unscreened buildings at these two barracks in 1926 as in any other preceding year. During 1926 the malaria rate in the screened barracks in Amritsar was one-fourth the average rate for the three preceding years, and at Lahore one-fifth. At Lahore the rate was less than one-third the rate in the unscreened barracks.

The writer concludes that the screening of barracks properly carried out is a means of reducing malaria among troops, but can not be considered as a sole antimalaria measure, its efficacy being more or less in inverse ratio to the evening attractions outside the barracks.

Specifications and Analyses of Gravel and Filter Sand—Where Sand May Be Obtained. Lewis O. Bernhagen. Proceedings Ninth Texas Water Works Short School, January, 1927, pp. 169–172. (Abstract by W. M. Olson.)

Modern filter-plant operators must produce good water at low cost. The perforated underdrain system has resulted in economy in construction and operation, but demands extreme care in selecting and grading the gravel bed. Complete specifications for gravel are included. "Gravel should not have flat surfaces." Gravel should be uniformly graded, washed, and placed carefully in five layers, as follows:

Layer	Depth in inches	Size in inches
First	5½	1½ to 1
Second	5	1 to ⅝.
Third	4½	⅝ to ⅜.
Fourth	4	⅜ to 3/16
Fifth	3	3/16 to 10-mesh.

Filter sand should be round rather than sharp. Other specifications for sand depend upon the water to be handled. Complete specifications for sand for filtering an average water are given. The effective size should be from 0.35 to 0.40 millimeters, and the uniformity coefficient from 1.55 to 1.65. Depth of sand bed after washing to be at least 30 inches.

Suitable gravel may be found in Texas. "An almost ideal filter sand may be obtained at Red Wing, Minnesota." Native Texas sands need to be tested carefully to insure conformity to specifications. Sets of standard sieves may be obtained from chemical supply houses.

"Engineers should investigate local conditions with greater care than is usually exercised before recommending gravel and sand for a certain plant."

Determining Coagulant Dosage by Bottle Tests. Lewis I. Birdsall. Proceedings Ninth Texas Water Works Short School, January, 1927, pp. 264–265. (Abstract by W. M. Olson.)

River waters change rapidly in quality. These changes require corresponding changes in the amount of coagulant to be used in a water purification plant. Procedure is outlined for bottle tests to appraise the amount of coagulant required.

Prepare standard solution by dissolving 32.4 grams of coagulant in 1 liter of water. (One cubic centimeter contains one-half grain of coagulant.) Provide one-half gallon glass jars for water samples and 10 cubic centimeters pipette graduated to 0.1 cubic centimeter.

Add a measured amount of standard solution to several samples of water, shake vigorously, let stand until the floc has formed, and choose the most satisfactory treatment. Bottle experiments usually indicate a need for more coagulant than is necessary in actual operation.

DEATHS DURING WEEK ENDED JANUARY 28, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended January 28, 1928, and corresponding week of 1927. (From the Weekly Health Index, February 1, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Jan. 28, 1928	Corresponding week, 1927
Policies in force	69, 811, 802	66, 591, 039
Number of death claims	14, 644	13, 132
Death claims per 1,000 policies in force, annual rate	11. 0	10. 3

Deaths from all causes in certain large cities of the United States during the week ended January 28, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 1, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Jan. 28, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Jan. 28, 1928 [2]
	Total deaths	Death rate [1]		Week ended Jan. 28, 1928	Corresponding week 1927	
Total (69 cities)	7, 546	13. 0	13. 3	740	787	61
Akron	28			2	8	22
Albany [3]	38	16. 5	15. 3	0	1	0
Atlanta	67	13. 8	16. 5	5	2	
White	33		14. 9	3	1	
Colored	34	(4)	20. 5	2	1	
Baltimore [3]	236	14 9	15. 6	24	25	76
White	184		14. 3	20	19	80
Colored	52	(4)	23. 4	4	6	63
Birmingham	64	15. 0	18 2	2	7	17
White	25		1 [illegible]	0	4	0
Colored	39	(4)	27. 1	2	3	45
Boston	210	13. 7	14. 5	21	24	58
Bridgeport	31			2	1	37
Buffalo	157	14. 8	14. 9	22	15	94
Cambridge	26	10. 8	16. 0	3	6	53
Camden	27	10. 4	14. 9	2	3	32
Canton	20	9. 0	12. 0	2	3	48
Chicago [3]	721	11. 9	12. 1	45	76	39
Cincinnati	110	13. 9	16. 4	14	7	85
Cleveland	232	12. 0	10. 6	18	14	49
Columbus	75	13. 2	15. 6	6	7	56
Dallas	55	13. 2	10 6	7	6	
White	41		9. 9	7	6	
Colored	14	(4)	15. 2	0	0	
Dayton	32	9. 1	13. 0	2	5	33
Denver	102	18. 1	18. 0	13	7	
Des Moines	32	11. 0	12. 6	3	4	50
Detroit	298	11. 3	13. 4	46	54	71
Duluth	15	6. 7	9. 1	1	4	23
El Paso	28	12 4	11. 9	2	3	
Erie	18			1	1	21
Fall River [3]	26	10. 1	13. 4	1	4	17
Flint	26	9. 1	9. 1	4	6	51
Fort Worth	34	10 6	14. 3	6	2	
White	29		13. 0	5	1	
Colored	5	(4)	23. 9	1	1	
Grand Rapids	18	5. 7	7. 1	0	3	0
Houston	74			5	6	
White	47			2	5	
Colored	27	(4)		3	1	
Indianapolis	106	14. 5	10. 0	10	7	76
White	83		9. 7	7	5	61
Colored	23	(4)	12. 8	3	2	182
Jersey City	82	13. 2	14. 8	9	13	67
Kansas City, Kans	26	11. 5	14. 2	4	7	84
White	18		10. 8	3	4	74
Colored	8	(4)	29. 5	1	3	145
Kansas City, Mo	101	13. 5	14. 7	5	10	35

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended January 28, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 1, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Jan. 28, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Jan. 28, 1928 [2]
	Total deaths	Death rate [1]		Week ended Jan. 28, 1928	Corresponding week 1927	
Knoxville	22	10.9	13.3	3	0	65
White	19		10.4	3	0	73
Colored	3	(4)	34.2	0	0	0
Los Angeles	294			29	30	83
Lowell	22	10.4	12.3	2	4	42
Lynn	22	10.9	12.9	1	1	25
Memphis	59	17.0	19.2	10	10	117
White	36		14.9	5	5	94
Colored	23	(4)	27.1	5	5	157
Milwaukee	102	9.8	10.7	11	18	49
Minneapolis	84	9.6	11.6	6	11	36
Nashville	51	19.2	20.1	7	5	110
White	32		16.3	6	4	128
Colored	19	(4)	29.5	1	1	60
New Bedford	24	10.5	9.2	5	6	108
New Haven	39	10.9	17.2	2	8	28
New Orleans	176	21.4	19.9	16	17	77
White	99		14.6	9	10	65
Colored	77	(4)	35.0	7	7	102
New York	1,523	13.2	12.1	191	130	77
Bronx Borough	196	10.8	9.0	16	12	48
Brooklyn Borough	507	11.5	9.9	70	43	70
Manhattan Borough	618	18.4	17.8	72	56	85
Queens Borough	158	9.7	8.8	28	15	113
Richmond Borough	44	15.3	13.9	5	4	90
Newark, N. J	89	9.8	11.1	8	14	41
Oakland	50	9.5	11.1	2	7	22
Oklahoma City	26			0	1	
Omaha	48	11.3	11.4	2	6	23
Paterson	39	14.1	13.1	2	6	35
Philadelphia	525	13.3	14.0	48	48	65
Pittsburgh	207	16.1	14.1	34	27	111
Portland, Oreg	92			7	4	75
Providence	66	12.1	10.6	10	11	87
Richmond	59	15.9	14.7	9	6	118
White	39		12.6	5	4	101
Colored	20	(4)	19.7	4	2	147
Rochester	90	14.3	10.9	13	6	105
St. Louis	245	15.1	15.0	8	22	27
St. Paul	47	9.7	10.6	4	3	38
Salt Lake City [3]	30	11.4	14.2	1	4	16
San Antonio	70	16.8	15.3	15	4	
San Diego	46	20.1	22.6	1	1	19
San Francisco	182	16.3	16.8	4	9	25
Schenectady	18	10.1	7.8	0	2	0
Seattle	70	9.6	11.3	2	7	21
Somerville	22	11.2	11.3	4	4	138
Spokane	33	15.8	19.1	3	5	77
Springfield, Mass	37	12.9	13.1	5	5	79
Syracuse	47	12.3	15.1	5	6	61
Tacoma	27	12.8	13.1	0	1	0
Toledo	65	10.9	14.3	4	6	38
Trenton	33	12.4	16.8	2	8	34
Utica	30	15.1	19.7	2	1	45
Washington, D. C	147	13.9	14.3	9	17	51
White	88		12.4	5	6	41
Colored	59	(4)	19.9	4	11	74
Waterbury	25			6	5	174
Wilmington, Del	32	13.0	14.4	0	4	0
Worcester	52	13.8	13.6	4	4	49
Yonkers	29	8.6	10.1	3	2	66
Youngstown	32	9.6	12.3	5	6	67

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, Jan. 27, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended February 5, 1927, and February 4, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 5, 1927, and February 4, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928
New England States:								
Maine	4	5	25	12	219	63	0	0
New Hampshire		1				16		0
Vermont	2				101	24	0	0
Massachusetts	111	118	21	15	169	1,486	1	3
Rhode Island	10	13			1	7	0	1
Connecticut	35	42	11	11	60	265	1	1
Middle Atlantic States:								
New York	402	482	[1] 154	[1] 47	803	1,234	7	15
New Jersey	102	152	37	19	44	367	1	4
Pennsylvania	335	356			950	1,487	1	5
East North Central States:								
Ohio		78		15		405		1
Indiana	57	33	51	57	236	80	0	0
Illinois	176	160	66	36	1,774	84	2	12
Michigan	130	66		4	219	459	0	5
Wisconsin	37	31	54	64	660	85	7	5
West North Central States:								
Minnesota	20	20		3	294	8	1	1
Iowa [2]	28	30			745	75	0	1
Missouri	57	56	8	6	233	80	1	0
North Dakota	4	15			94	6	1	1
South Dakota	7	3	7	2	183	27	0	0
Nebraska	6	19	20		143	3	0	0
Kansas	25	22	7	6	591	28	5	3
South Atlantic States:								
Delaware	2	4	6		1	13	0	0
Maryland [2]	46	43	69	53	26	504	1	1
District of Columbia	12	33	2		5	22	0	0
Virginia								
West Virginia	23	21	58	27	151	125	1	1
North Carolina	44	51			209	3,666	0	1
South Carolina	24	25	684	1,397	11	1,304	0	0
Georgia	24	17	171	218	119	314	5	0
Florida	26	22	11	6	66	7	1	0

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 5, 1927, and February 4, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928
East South Central States:								
Kentucky		12				205		0
Tennessee	19	24	93	110	179	526	0	0
Alabama	29	21	74	235	124	212	0	0
Mississippi	13	11						
West South Central States:								
Arkansas	6	7	106	170	8	384	0	2
Louisiana	21	14	13	37	140	212	1	0
Oklahoma [3]	17	42	311	255	98	108	1	1
Texas	64	95	174	453	9	89	0	1
Mountain States:								
Montana	2	20			88		7	6
Idaho	2		4		71	1	0	3
Wyoming	1	1	1		220	2	0	2
Colorado	9	14	1		188	52	2	10
New Mexico	2	5			43	157	0	0
Arizona	7	8			23	2	0	7
Utah [2]	13	4	2	7	[illegible]	2	0	1
Nevada								
Pacific States:								
Washington	10	31			189	292	4	1
Oregon	14	8	180	37	64	43	4	2
California	159	138	40	57	2,409	127	9	5

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928
New England States:								
Maine	0	3	32	45	0	0	2	0
New Hampshire		0		13		0		0
Vermont	0	0	4	8	0	0	0	0
Massachusetts	0	1	450	324	0	0	7	7
Rhode Island	0	0	32	40	0	0	0	0
Connecticut	1	2	116	85	0	6	1	0
Middle Atlantic States:								
New York	0	8	942	724	14	11	32	14
New Jersey	0	1	331	279	0	0	1	6
Pennsylvania	1	0	803	731	2	0	18	33
East North Central States:								
Ohio		2		392		42		15
Indiana	0	0	366	130	216	140	2	3
Illinois	0	3	438	362	37	30	17	16
Michigan	0	2	348	283	43	39	6	25
Wisconsin	0	1	146	217	15	35	2	6
West North Central States:								
Minnesota	0	0	275	163	4	5	3	1
Iowa [3]	1	1	92	114	6	74	0	2
Missouri	1	0	196	116	14	37	5	2
North Dakota	0	0	61	89	3	0	2	2
South Dakota	1	1	80	85	12	44	0	0
Nebraska	0	2	93	91	26	40	8	2
Kansas	1	0	192	179	29	119	0	0
South Atlantic States:								
Delaware	0	0	46	2	1	0	0	0
Maryland [2]	0	2	87	55	0	0	8	2
District of Columbia	0	0	26	36	2	0	0	0
Virginia								
West Virginia	0	1	59	59	13	13	12	3
North Carolina	0	0	66	48	60	129	5	4
South Carolina	1	3	11	10	23	4	9	9
Georgia	0	0	22	35	106	0	9	7
Florida	0	0	21	18	59	3	4	5

[2] Week ended Friday. [3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 5, 1927, and February 4, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928	Week ended Feb. 5, 1927	Week ended Feb. 4, 1928
East South Central States:								
Kentucky	---	0	---	57	---	52	---	6
Tennessee	1	0	28	29	9	24	7	4
Alabama	0	0	18	16	71	1	7	4
Mississippi	0	0	17	13	48	7	9	2
West South Central States:								
Arkansas	0	0	7	76	3	6	5	12
Louisiana	0	0	9	16	12	14	4	11
Oklahoma [3]	0	0	65	57	41	233	9	7
Texas	0	3	37	141	331	96	1	9
Mountain States:								
Montana	0	0	116	0	33	44	0	1
Idaho	0	0	39	4	0	6	1	2
Wyoming	0	0	20	15	0	6	0	0
Colorado	2	0	176	105	17	24	1	2
New Mexico	1	2	21	35	2	0	3	2
Arizona	0	1	15	2	0	3	2	0
Utah [2]	0	0	32	6	8	18	0	0
Nevada	---	---	---	---	---	---	---	---
Pacific States:								
Washington	0	2	159	74	64	40	4	2
Oregon	0	3	77	22	30	48	1	6
California	2	17	299	218	17	39	2	13

[2] Week ended Friday.

[3] Exclusive of Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December, 1927										
California	13	613	96	1	183	6	74	728	68	39
Florida	4	71	35	21	21	3	1	46	3	14
Idaho	5	20	---	---	6	---	1	72	28	1
Montana	13	16	15	---	4	---	3	90	84	3
North Carolina	4	346			5,727		3	317	203	12
Ohio	8	900	56	---	695	---	30	1,185	86	117
South Carolina	0	379	2,978	783	2,210	162	10	100	17	83
South Dakota	5	7	23	---	104		4	205	52	7
Tennessee	4	167	400	42	1,167	16	6	192	63	90
Washington	16	74	21	---	676	---	29	222	186	23

December, 1927

	Cases
Chicken pox:	
California	1,116
Florida	55
Idaho	86
Montana	75
North Carolina	598
Ohio	1,722
South Carolina	211
South Dakota	58
Tennessee	130
Washington	315
Conjunctivitis:	
Idaho	6
Dengue:	
South Carolina	1

	Cases
Dysentery:	
California	
Amebic	5
Bacillary	4
Florida	7
Ohio	2
Tennessee	3
German measles:	
California	292
Montana	2
North Carolina	14
Ohio	27
Washington	41
Hookworm disease:	
California	1
Florida	22
South Carolina	211

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Impetigo contagiosa:	Cases
Washington	10
Jaundice:	
California	4
Montana	1
Lead poisoning:	
Ohio	9
Lethargic encephalitis:	
California	7
Idaho	1
Montana	1
Ohio	9
Tennessee	1
Washington	2
Malta fever:	
California	1
Mumps:	
California	321
Florida	12
Idaho	43
Montana	4
Ohio	720
South Dakota	35
Tennessee	117
Washington	200
Ophthalmia neonatorum:	
North Carolina	1
Ohio	119
South Carolina	30
Paratyphoid fever:	
California	2
South Carolina	5
Washington	2
Rabies in animals:	
California	42

Rabies in animals—Continued.	Cases
Idaho	1
South Carolina	15
Scabies:	
Washington	8
Septic sore throat:	
Montana	1
North Carolina	3
Ohio	82
Tennessee	2
Tetanus:	
California	5
Florida	6
Trachoma:	
California	9
Ohio	3
Trichinosis:	
California	2
Tularaemia:	
California	1
Typhus fever:	
Florida	2
Vincent's angina:	
Washington	1
Whooping cough:	
California	369
Florida	4
Idaho	1
Montana	11
North Carolina	364
Ohio	404
South Carolina	399
South Dakota	16
Tennessee	65
Washington	33

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 100 cities reporting cases used in the following table are situated in all parts of the county and have an estimated aggregate population of more than 31,620,000. The estimated population of the 94 cities reporting deaths is more than 30,900,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended January 21, 1928, and January 22, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
42 States	2,137	1,974	
100 cities	1,165	1,044	1,126
Measles:			
42 States	11,663	10,070	
100 cities	3,648	2,688	
Poliomyelitis:			
43 States	46	20	
Scarlet fever:			
43 States	4,846	5,633	
100 cities	1,626	2,284	1,450
Smallpox:			
42 States	1,161	843	
100 cities	133	121	118
Typhoid fever:			
43 States	198	255	
100 cities	37	41	51
Deaths reported			
Influenza and pneumonia:			
94 cities	1,201	1,183	
Smallpox:			
94 cities	0	1	
Kansas City, Mo	0	1	

City reports for week ended January 21, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year ealier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	12	2	0	0	0	0	0	1
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	1
Manchester	84,000	0	2	0	0	0	1	0	5
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Burlington	[1] 24,089	1	0	0	0	0	3	0	0
Massachusetts:									
Boston	787,000	55	56	23	2	0	404	4	29
Fall River	131,000	3	6	1	1	2	2	1	4
Springfield	145,000	2	3	10	0	1	3	17	1
Worcester	193,000	12	6	6	0	0	3	55	4
Rhode Island:									
Pawtucket	71,000	1	1	1	0	0	2	2	4
Providence	275,000	6	10	13	1	1	11	4	10
Connecticut.									
Bridgeport	(²)	3	8	12	1	1	0	0	3
Hartford	164,000	11	8	4	1	1	2	5	6
New Haven	182,000	15	3	3	0	2	116	42	5
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	25	15	18		0	392	56	15
New York	5,924,000	153	214	353	24	17	135	36	248
Rochester	321,000	8	13	14		0	1	6	7
Syracuse	185,000	34	5	2	1	1	77	0	5
New Jersey:									
Camden	131,000	3	6	11	0	1	1	2	5
Newark	459,000	27	17	21	4	0	126	25	10
Trenton	134,000	0	5	0	0	0	10	0	3
Pennsylvania:									
Philadelphia	2,008,000	82	84	60		17	49	57	65
Pittsburgh	637,000	35	20	36		1	189	82	37
Reading	114,000	25	4	3		1	2	2	1
Scranton	143,000	2		13			1	0	
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	15	11	13	0	3	215	2	11
Cleveland	960,000	54	35	60	2	3	14	130	23
Columbus	285,000	8	6	3	3	1	3	11	5
Toledo	295,000	36	10	3	3	3	181	26	5
Indiana:									
Fort Wayne	99,900	1	4	6	0	0	0	0	3
Indianapolis	367,000	12	11	4	0	0	9	58	9
South Bend	81,700	4	1	0	0	0	0	0	0
Terre Haute	71,900	1	1	3	0	0	0	0	6
Illinois:									
Chicago	3,048,000	100	94	130	15	10	17	36	94
Springfield	64,700	5	1	5	4	3	1	13	2

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended January 21, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit	1,290,000	45	71	51	5	6	213	48	33
Flint	136,000	7	7	5	0	0	4	82	2
Grand Rapids	156,000	5	4	1	0	0	18	5	3
Wisconsin:									
Kenosha	52,700	22	2	2	0	0	1	1	0
Madison	47,600	4	0	0	0		0	5	
Milwaukee	517,000	69	23	5	0	0	2	15	14
Racine	69,400	3	2	6	0	0	1	4	0
Superior	[1] 39,671	0	1	0	0	0	0	3	4
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	0	3	0	0	0	0	0	1
Minneapolis	434,000	78	22	20	0	2	1	16	11
St. Paul	248,000	7	16	2	0	1	0	30	9
Iowa:									
Davenport	[1] 52,469	0	1	1	0		0	0	
Des Moines	146,000	0	4	0	0		0	0	
Sioux City	78,000	6	2	0	0		83	11	
Waterloo	36,000	3	0	1	0		1	0	
Missouri:									
Kansas City	375,000	19	9	2	2	2	2	139	20
St. Joseph	78,400	2	3	1	0	3	0	0	5
St. Louis	830,000	18	53	41	0	0	44	20	
North Dakota:									
Fargo	[1] 26,403	5	0	0	0	0	1	3	2
Grand Forks	[1] 14,811	3	1	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	3	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	19	2	0	0	0	0	15	0
Omaha	216,000	11	5	3	0	0	1	2	10
Kansas:									
Topeka	56,500	28	2	0	1	1	0	0	5
Wichita	92,500	11	4	1	0	0	0	0	4
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	0	3	2	0	0	1	2	9
Maryland:									
Baltimore	808,000	109	42	14	22	5	305	15	38
Cumberland	[1] 33,741	0	1	1	2	0	0	0	6
Frederick	[1] 12,035	1	0	0	0	0	0	0	1
District of Columbia:									
Washington	528,000	12	21	32	1	1	5	0	13
Virginia:									
Lynchburg	30,500	11	2	0	0	0	0	1	2
Norfolk	174,000	25	8	1	0	0	6	3	10
Richmond	189,000	5	6	7	0	1	41	1	6
Roanoke	61,900	0	1	1	0	2	3	0	3
West Virginia:									
Charleston	50,700	0	2	2	0	0	0	0	1
Wheeling	[1] 56,208	15	1	0	0	0	0	0	5
North Carolina:									
Raleigh	[1] 30,371	3	1	5	0	0	14	0	0
Wilmington	37,700	0	1	3	0	0	153	1	1
Winston-Salem	71,800	2	1	1	0	0	84	16	1
South Carolina:									
Charleston	74,100	0	1	0	130	1	7	0	6
Columbia	41,800	12	1	0	0	1	175	17	3
Greenville	[1] 27,311		0						
Georgia:									
Atlanta	([2])	6	4	5	29	3	1	4	17
Brunswick	[1] 16,809	0	0	0	0	0	12	3	0
Savannah	94,900	0	1	4	9	1	47	2	3
Florida:									
Miami	[1] 69,754	10		1	0	0	0	3	5
St. Petersburg	[1] 26,847		0			0			0
Tampa	102,000	6	1	4	0	0	1	1	5

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended January 21, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	2	1	0	0	0	22	0	3
Lexington	47,500	2	-------	2	0	1	2	4	2
Louisville	311,000	4	7	6	5	0	15	6	21
Tennessee:									
Memphis	177,000	5	5	7	0	6	234	15	2
Nashville	137,000	0	1	0	0	5	2	6	6
Alabama:									
Birmingham	211,000	6	3	3	19	9	5	7	15
Mobile	66,800	0	2	4	1	0	0	0	1
Montgomery	47,000	5	1	1	4	-------	0	0	-------
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	31,643	0	0	1	0	-------	0	0	-------
Little Rock	75,900	0	2	0	0	0	65	0	3
Louisiana:									
New Orleans	419,000	0	13	7	17	10	3	0	31
Shreveport	59,500	8	2	2	0	0	17	0	5
Oklahoma:									
Oklahoma City	(2)	3	3	3	14	0	3	0	2
Tulsa	133,000	4	2	2	0	-------	1	4	-------
Texas:									
Dallas	203,000	20	7	11	5	3	1	0	8
Fort Worth	159,000	30	4	2	0	0	2	2	4
Galveston	49,100	0	1	1	0	0	5	0	5
Houston	[1] 164,954	3	6	14	0	3	2	0	9
San Antonio	205,000	1	2	2	1	0	47	0	11
MOUNTAIN									
Montana:									
Billings	[1] 17,971	1	0	0	0	0	0	0	0
Great Falls	[1] 29,883	0	0	0	0	0	2	0	0
Helena	[1] 12,037	0	0	1	0	0	0	0	0
Missoula	[1] 12,668	1	1	0	0	0	1	0	0
Idaho:									
Boise	[1] 23,042	2	0	0	0	0	0	2	0
Colorado:									
Denver	285,000	47	11	9	-------	7	6	28	17
Pueblo	43,900	22	2	2	0	0	1	0	1
New Mexico:									
Albuquerque	[1] 21,000	5	0	1	0	0	38	3	0
Utah:									
Salt Lake City	133,000	24	3	7	0	1	1	0	3
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	14	5	0	0	-------	179	16	-------
Spokane	109,000	12	3	0	0	-------	0	0	-------
Tacoma	106,000	8	4	0	0	0	8	8	4
Oregon:									
Portland	[1] 282,383	34	11	5	0	1	9	1	6
California:									
Los Angeles	(2)	40	48	31	29	4	5	20	32
Sacramento	73,400	4	3	1	0	0	3	0	0
San Francisco	567,000	60	21	17	3	1	13	23	6

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended January 21, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	5	0	0	0	0	0	0	0	11	20
New Hampshire:											
Concord	0	1	0	0	0	0	0	0	0	0	12
Manchester	2	0	0	0	0	2	0	0	0	0	25
Vermont:											
Barre	1	0	0	0	0	0	0	0	0	0	1
Burlington	1	1	0	0	0	0	0	0	0	0	5
Massachusetts:											
Boston	78	113	0	0	0	13	1	1	0	81	254
Fall River	3	17	0	0	0	2	0	2	0	0	24
Springfield	8	16	0	0	0	0	0	0	0	13	40
Worcester	12	10	0	0	0	6	0	1	0	9	54
Rhode Island:											
Pawtucket	1	2	0	0	0	1	0	0	0	0	14
Providence	9	39	0	0	0	2	0	0	0	2	75
Connecticut:											
Bridgeport	12	9	0	0	0	2	0	0	0	3	34
Hartford	8	6	0	0	0	3	0	0	0	4	-----
New Haven	11	3	0	0	0	1	0	0	0	37	36
MIDDLE ATLANTIC											
New York:											
Buffalo	25	28	0	0	0	5	1	0	0	28	136
New York	249	310	0	0	0	92	11	5	0	195	1,570
Rochester	14	6	0	0	0	1	0	0	0	5	80
Syracuse	15	23	0	0	0	3	0	1	0	28	38
New Jersey:											
Camden	6	5	0	0	0	0	0	0	0	2	36
Newark	29	20	0	0	0	6	1	1	0	68	88
Trenton	5	5	0	0	0	3	1	0	0	4	31
Pennsylvania:											
Philadelphia	92	104	1	0	0	20	3	0	0	65	516
Pittsburgh	44	25	0	0	0	10	1	0	0	12	174
Reading	2	25	0	0	0	2	0	0	0	4	32
Scranton	------	0	------	0	------	------	------	0	------	5	------
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	21	21	1	0	0	11	1	0	0	2	133
Cleveland	45	33	1	0	0	16	1	1	0	55	196
Columbus	11	17	1	0	0	7	0	0	0	1	88
Toledo	14	9	0	1	0	8	0	0	1	4	80
Indiana:											
Fort Wayne	6	5	1	0	0	2	0	1	0	0	27
Indianapolis	9	15	12	5	0	3	0	0	0	2	112
South Bend	3	1	1	1	0	0	0	0	0	0	12
Terre Haute	4	0	0	5	0	1	0	0	0	0	30
Illinois:											
Chicago	145	143	2	2	0	45	3	5	0	151	680
Springfield	2	11	0	0	0	1	0	0	0	5	22
Michigan:											
Detroit	100	107	3	1	0	26	1	1	0	83	274
Flint	10	25	1	0	0	0	0	1	0	7	18
Grand Rapids	14	5	1	0	0	2	1	0	0	2	29
Wisconsin:											
Kenosha	2	8	1	0	0	0	0	0	0	2	6
Madison	4	4	1	0	------	------	0	0	------	0	------
Milwaukee	30	38	2	0	0	9	0	0	0	19	110
Racine	7	6	1	0	0	0	0	0	0	12	13
Superior	3	2	1	0	0	1	0	0	0	0	13
WEST NORTH CENTRAL											
Minnesota:											
Duluth	10	3	1	0	0	1	0	1	0	3	26
Minneapolis	60	20	6	0	0	7	1	0	0	1	96
St. Paul	33	19	9	0	0	2	0	0	0	7	65

City reports for week ended January 21, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL—contd.											
Iowa:											
Davenport	1	9	2	3	....	....	0	0	....	0	....
Des Moines	7	21	2	16	....	....	0	0	....	0	36
Sioux City	2	1	2	2	....	....	0	0	....	0	....
Waterloo	2	1	1	0	....	....	0	0	....	2	....
Missouri:											
Kansas City	15	9	3	1	0	6	0	0	0	11	111
St. Joseph	3	3	0	20	0	1	0	0	0	0	39
St. Louis	48	39	3	2	0	8	1	0	0	13	260
North Dakota:											
Fargo	2	2	1	0	0	0	0	0	0	2	9
Grand Forks	0	0	0	0	....	....	0	0	....	0	....
South Dakota:											
Aberdeen	1	1	0	0	....	....	0	0	....	1	....
Nebraska:											
Lincoln	4	2	0	5	0	0	0	0	0	12	13
Omaha	5	12	9	1	0	2	0	0	0	0	62
Kansas:											
Topeka	2	0	1	0	0	0	0	0	0	13	25
Wichita	4	6	1	36	0	0	0	0	0	1	31
SOUTH ATLANTIC											
Delaware:											
Wilmington	6	2	0	0	0	0	0	0	0	0	37
Maryland:											
Baltimore	41	47	0	0	0	11	2	0	1	26	253
Cumberland	0	1	0	0	0	0	0	0	0	0	19
Frederick	0	1	0	0	0	0	0	0	0	0	1
Dist. of Columbia:											
Washington	24	29	0	0	0	12	1	0	0	10	162
Virginia:											
Lynchburg	1	0	0	0	0	2	0	0	0	1	18
Norfolk	3	8	0	0	0	3	0	0	0	0	....
Richmond	5	8	0	0	0	4	1	1	0	1	51
Roanoke	1	6	0	0	0	2	0	0	0	4	24
West Virginia:											
Charleston	1	4	0	0	0	1	0	0	0	0	17
Wheeling	2	2	0	0	0	1	0	0	1	0	23
North Carolina:											
Raleigh	1	2	0	1	0	0	0	0	0	3	14
Wilmington	0	0	0	0	0	0	0	0	0	0	11
Winston-Salem	2	0	4	0	0	0	0	0	0	0	....
South Carolina:											
Charleston	1	0	0	0	0	2	0	0	0	1	27
Columbia	1	0	1	0	0	0	0	0	0	4	15
Greenville	0	....	1	....	....	....	0	....	....	....	....
Georgia:											
Atlanta	4	5	4	1	0	5	0	0	0	1	84
Brunswick	0	0	0	0	0	1	0	0	0	0	6
Savannah	0	0	1	6	0	3	1	1	0	2	28
Florida:											
Miami	....	0	....	0	0	1	....	0	0	0	30
St. Petersburg	0	....	0	....	0	0	0	....	0	....	16
Tampa	1	3	0	0	0	2	1	1	0	0	33
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	2	0	1	0	0	0	0	0	1	23
Lexington	....	0	....	0	0	3	....	0	0	0	16
Louisville	6	25	0	1	0	4	0	0	0	6	85
Tennessee:											
Memphis	7	3	2	2	0	6	0	1	0	2	77
Nashville	3	1	1	0	0	3	0	3	0	0	52
Alabama:											
Birmingham	6	3	4	7	0	7	1	0	0	0	89
Mobile	1	2	0	0	0	3	1	0	0	0	19
Montgomery	1	2	1	0	....	....	1	2	....	2	....

City reports for week ended January 21, 1928—**Continued**

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	1	0	0			0	0		2	
Little Rock	2	0	1	0	0	5	1	0	1	1	
Louisiana:											
New Orleans	6	1	0	0	0	13	2	3	1	3	185
Shreveport	0	2	1	0	0	2	0	0	0	0	24
Oklahoma:											
Oklahoma City	2	0	1	16	0	0	0	0	0	0	36
Tulsa	2	1	0	3			0	0		0	
Texas:											
Dallas	4	6	2	1	0	2	0	0	0	1	54
Fort Worth	1	6	0	0	0	3	0	1	0	0	30
Galveston	0	1	1	0	0	2	1	0	0	0	20
Houston	2	5	2	0	0	4	1	0	0	0	67
San Antonio	0	6	0	0	0	12	1	0	0	0	65
MOUNTAIN											
Montana:											
Billings	2	0	1	0	0	0	0	0	0	7	10
Great Falls	1	8	1	2	0	0	1	0	0	0	2
Helena	1	0	0	0	0	0	0	0	0	0	2
Missoula	1	0	1	2	0	0	0	0	0	0	1
Idaho:											
Boise	2	1	0	0	0	0	1	0	0	0	4
Colorado:											
Denver	12	10	2	0	0	12	0	1	0	6	114
Pueblo	2	5	0	1	0	0	1	0	0	7	7
New Mexico:											
Albuquerque	1	3	0	0	0	7	0	0	0	0	14
Utah.											
Salt Lake City	3	5	2	7	0	1	0	0	0	3	32
Nevada:											
Reno	1	1	0	0	0	0	0	0	0	0	4
PACIFIC											
Washington:											
Seattle	12	2	3	3			1	2		5	
Spokane	4	17	4	17			0	0		0	
Tacoma	3	8	4	1	0	0	0	0	0	8	27
Oregon:											
Portland	6	4	7	23	0	2	0	0	0	0	
California:											
Los Angeles	30	26	5	1	0	30	2	0	2	18	276
Sacramento	1	3	1	0	0	0	1	0	0	0	23
San Francisco	15	38	2	3	0	18	1	1	0	5	164

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	0	0	0	0	0	1	4	0
Worcester	0	0	1	0	0	0	0	0	0
Connecticut:									
Hartford	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	0	0	0	2	0	0	1	2	1
New Jersey:									
Newark	1	0	1	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	1	1	0	0	0	0	0	0	0
Pittsburgh	0	0	1	0	0	0	0	0	0

City reports for week ended January 21, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cleveland	2	0	0	0	0	0	1	0	0
Columbus	0	0	0	0	0	0	0	2	0
Illinois:									
Chicago	8	2	0	0	0	0	0	1	1
Springfield	1	0	0	0	0	0	0	0	0
Michigan:									
Detroit	0	0	1	1	0	0	0	0	1
Wisconsin:									
Milwaukee	1	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	2	0	0	0	0	0	0	0	0
Iowa:									
Des Moines	1		0		0		0	0	
Missouri:									
Kansas City	0	0	0	0	0	0	0	2	0
St. Louis	3	1	1	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	3	1	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	0	0	0	0	0	0	0
Virginia:									
Richmond	1	1	0	0	0	0	0	0	0
West Virginia:									
Charleston	0	1	0	0	0	0	0	0	0
North Carolina:									
Raleigh	0	0	0	0	0	2	0	0	0
South Carolina:									
Charleston	0	0	0	0	1	0	0	0	0
Georgia:									
Savannah [1]	0	0	0	0	3	1	0	0	0
EAST SOUTH CENTRAL									
Kentucky:									
Louisville	1	0	0	0	0	0	0	0	0
Tennessee:									
Nashville	0	0	0	0	0	1	0	0	0
Alabama:									
Birmingham	1	0	0	0	1	1	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	1	0	0	0	0	0	0	0
Louisiana:									
New Orleans	0	0	0	0	2	2	0	0	0
Texas:									
Dallas	0	0	0	0	1	1	0	0	0
Houston	0	1	0	0	1	1	0	0	0
MOUNTAIN									
Colorado:									
Denver	6	1	0	0	0	0	0	0	0
Pueblo	1	0	0	0	0	0	0	0	0
Utah:									
Salt Lake City	2	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	1		0		0		0	0	
Spokane	2		0		0		0	0	
Tacoma	0	0	0	0	0	0	0	1	0
Oregon:									
Portland	1	0	0	0	0	0	0	1	0
California:									
Los Angeles	1	0	0	0	1	1	0	2	0

[1] Typhus fever: 1 case at Savannah, Ga.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended January 21, 1928, compared with those for a like period ended January 22, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, December 18, 1927, to January 21, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926-27 [1]

	Week ended—									
	Dec. 25, 1926	Dec. 24, 1927	Jan 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928
DIPHTHERIA CASE RATES										
101 cities	[2] 163	201	176	185	198	[3] 169	186	200	175	[4] 193
New England	160	193	158	165	158	149	174	200	151	168
Middle Atlantic	140	233	171	221	182	202	176	253	191	252
East North Central	[5] 182	212	193	200	223	176	189	220	170	192
West North Central	113	123	165	125	188	115	158	111	146	138
South Atlantic	[6] 214	143	173	129	222	[7] 154	215	142	161	[4] 145
East South Central	150	127	186	112	137	90	248	50	152	105
West South Central	168	344	223	264	252	[8] 246	244	204	170	152
Mountain	137	117	137	63	126	71	117	115	117	168
Pacific	225	157	155	141	230	123	193	143	232	125
MEASLES CASE RATES										
101 cities	[2] 209	285	231	322	384	[3] 518	339	566	451	[4] 603
New England	107	536	184	708	253	917	195	1,021	549	1,248
Middle Atlantic	22	251	22	331	81	466	38	500	49	478
East North Central	[5] 249	157	294	160	427	265	406	300	545	326
West North Central	77	38	61	46	259	134	192	109	277	259
South Atlantic	[6] 62	797	179	832	204	[7] 1,461	202	1,496	301	[4] 1,514
East South Central	31	713	78	397	106	1,566	96	1,521	203	1,387
West South Central	103	84	13	113	186	[8] 197	302	268	447	560
Mountain	2,780	18	3,545	36	5,227	62	3,434	106	5,074	97
Pacific	879	257	697	283	1,517	383	1,478	526	1,342	531
SCARLET FEVER CASE RATES										
101 cities	[2] 253	187	267	210	318	[3] 208	366	258	384	[4] 269
New England	248	281	356	346	491	340	479	398	537	508
Middle Atlantic	212	173	235	200	285	196	338	266	368	268
East North Central	[5] 255	212	245	257	288	234	345	285	336	286
West North Central	371	202	385	193	449	203	556	261	517	224
South Atlantic	[6] 171	145	238	149	231	[7] 152	258	168	280	[4] 209
East South Central	243	117	176	117	233	190	213	140	335	190
West South Central	125	92	150	126	153	[8] 103	141	124	194	88
Mountain	975	171	893	234	950	195	1,112	301	1,345	265
Pacific	303	191	252	126	340	184	376	220	319	240

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1926, 1927, and 1928, respectively.
[2] Terre Haute, Ind., and Norfolk, Va., not included.
[3] Atlanta, Ga., and Fort Smith, Ark., not included.
[4] Greenville, S. C., not included.
[5] Terre Haute, Ind., not included.
[6] Norfolk, Va., not included.
[7] Atlanta, Ga., not included.
[8] Fort Smith, Ark., not included.

Summary of weekly reports from cities, December 18, 1927, to January 21, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926–27—Continued

SMALLPOX CASE RATES

	Week ended—									
	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928
101 cities	[2] 14	16	14	15	22	[3] 17	22	28	20	[4] 22
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	1	0	0	0	1	0	1	0
East North Central	[5] 16	12	7	12	32	9	21	7	17	9
West North Central	28	77	40	79	57	105	69	146	59	121
South Atlantic	[6] 30	20	41	4	27	[7] 12	51	26	34	[4] 14
East South Central	36	20	47	10	41	5	86	15	25	55
West South Central	26	13	21	4	41	[8] 16	25	28	62	4
Mountain	18	99	9	144	0	106	0	142	0	106
Pacific	43	26	21	29	60	26	37	31	63	64

TYPHOID FEVER CASE RATES

	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928
101 cities	[2] 10	11	12	7	8	[3] 5	9	8	7	[4] 6
New England	40	9	24	14	9	7	21	14	2	9
Middle Atlantic	5	10	7	4	6	3	8	5	5	3
East North Central	[5] 3	8	5	5	5	3	1	3	6	6
West North Central	10	8	4	10	8	2	6	8	4	2
South Atlantic	[6] 16	16	34	13	7	[7] 15	16	2	7	[4] 5
East South Central	16	25	21	10	25	20	15	55	10	30
West South Central	17	17	17	21	25	[8] 0	17	20	4	12
Mountain	0	9	27	18	9	9	9	0	27	9
Pacific	21	10	16	0	8	5	21	10	21	8

INFLUENZA DEATH RATES

	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928
95 cities	[2] 15	17	17	19	20	[7] 19	21	24	21	[4] 25
New England	7	5	12	5	16	16	14	7	5	18
Middle Atlantic	14	11	21	14	18	13	20	21	20	19
East North Central	[5] 10	13	15	10	17	10	16	13	25	17
West North Central	11	10	8	8	14	4	10	14	4	18
South Atlantic	[6] 34	20	17	22	16	[7] 21	23	37	20	[4] 27
East South Central	36	46	26	56	48	89	37	78	16	105
West South Central	18	73	13	82	42	82	42	66	42	66
Mountain	27	27	46	72	63	53	99	62	54	71
Pacific	4	24	0	31	10	24	14	37	31	17

PNEUMONIA DEATH RATES

	Dec. 25, 1926	Dec. 24, 1927	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928
95 cities	[2] 137	135	164	157	195	[7] 170	179	191	183	[4] 179
New England	151	121	172	146	181	103	191	179	207	156
Middle Atlantic	166	127	180	158	208	186	204	214	197	193
East North Central	[5] 109	105	134	135	169	140	152	158	138	137
West North Central	91	98	118	108	116	124	124	112	116	137
South Atlantic	[6] 153	186	187	188	229	[7] 231	189	252	278	[4] 230
East South Central	109	204	191	183	213	235	207	225	255	251
West South Central	84	233	150	310	238	238	178	287	195	308
Mountain	164	243	201	198	368	195	197	168	215	186
Pacific	184	165	198	138	210	176	169	142	134	142

[2] Terre Haute, Ind., and Norfolk, Va., not included.
[3] Atlanta, Ga., and Fort Smith, Ark., not included.
[4] Greenville, S. C., not included.
[5] Terre Haute, Ind., not included.
[6] Norfolk, Va., not included.
[7] Atlanta, Ga., not included.
[8] Fort Smith, Ark., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

PLAGUE ON VESSEL

Steamship "Dryden"—At Liverpool, England, from ports on the La Plata River—Rodent plague.—The finding of seven plague-infected rats on the steamship *Dryden* at Liverpool, England, from ports on the La Plata River, Argentina, was reported January 20, 1928. The *Dryden* arrived at Liverpool January 5 and sailed for Glasgow, Scotland, January 15, 1928.

THE FAR EAST

Report for the week ended January 7, 1928.—The following report for the week ended January 7, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

India.—Rangoon, Bassein.
Ceylon.—Colombo.

CHOLERA

India.—Calcutta, Rangoon, Moulmein.
Straits Settlements.—Singapore.
Siam.—Bangkok.
French Indo-China.—Saigon-Cholon.

SMALLPOX

Egypt.—Suez.
India.—Karachi, Bombay, Cochin, Tuticorin, Madras, Vizagapatam, Calcutta, Rangoon.
Siam.—Bangkok.
French Indo-China.—Saigon.
Japan.—Moji.

Returns for the week ended January 7 were not received from Canton, China, or Vladivostok, Union of Socialist Soviet Republics.

BRAZIL

Rio de Janeiro—Communicable diseases—1926–1927.—Communicable diseases have been reported for the city of Rio de Janeiro for the year 1926 and the first six months of 1927, as follows:

Disease	Cases: Year 1926	Cases: January to June, 1927	Disease	Cases: Year 1926	Cases: January to June, 1927
Cerebrospinal meningitis	25	12	Plague	4	
Chicken pox	46	42	Poliomyelitis	1	2
Diphtheria	240	134	Scarlet fever		1
Dysentery	138	160	Smallpox	4,146	87
Influenza	37	34	Tetanus	1	2
Leprosy	25		Trachoma	2	
Lethargic encephalitis	1		Typhoid fever	243	89
Malaria	122	196	Whooping cough	9	18
Measles	21	58			

CANADA

Provinces—Communicable diseases—Week ended January 21, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended January 21, 1927, as follows:

Diseases	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Influenza	12							12
Smallpox				52		39	1	92
Typhoid fever	6	2	32	13		1		54

Quebec—Communicable diseases—Week ended January 21, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended January 21, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	53	Scarlet fever	114
Diphtheria	62	Smallpox	7
German measles	6	Tuberculosis	89
Influenza	4	Typhoid fever	32
Measles	161	Whooping cough	28

Quebec—Vital statistics—November, 1927.—Births and deaths in the Province of Quebec for the month of November, 1927, were reported as follows:

Estimated population	2,604,000	Deaths from—	
Births	5,746	Diphtheria	55
Birth rate per 1,000 population	26.48	Heart disease	307
Deaths	2,538	Influenza	35
Death rate per 1,000 population	11.70	Measles	11
Deaths under 1 year	697	Pneumonia	195
Infant mortality rate	121.30	Poliomyelitis	1
Deaths from—		Scarlet fever	19
Accidents (all)	74	Syphilis	2
Cancer	137	Tuberculosis (pulmonary)	160
Cerebrospinal meningitis	3	Tuberculosis (other forms)	36
Diabetes	28	Typhoid fever	23
Diarrhea	97	Whooping cough	29

St. John, New Brunswick—Health statistics—Lowered typhoid fever prevalence—Year ended October 3, 1927.—Information relative to health conditions at St. John, New Brunswick, Canada, shows a lowered typhoid fever prevalence, a total of 9 cases being reported for the city of St. John and 2 cases for the county, as compared with 13 cases for the city and 10 cases for the county reported during the previous 12 months. One typhoid-fever death was reported. This was stated as showing the first fatal case of the disease reported in three years. From 1920 to 1923 the average annual typhoid-fever

occurrence was 57 cases, and in the period 1924 to 1927 an average of 19 cases for each year.

Tuberculosis.—There were reported during the year 121 cases of tuberculosis with 66 deaths for the city and district. Of the deaths, 57 were of city residents, being 6 in excess of the tuberculosis deaths reported for the previous year.

Other communicable diseases.—Other communicable diseases reported were: Chicken pox, 56 cases; epidemic influenza and lethargic encephalitis, each, 2 cases with 2 deaths; measles, 12 cases; poliomyelitis, 1 case with 1 death.

Infant mortality—Child-welfare work.—Infant mortality reported at St. John, New Brunswick, during the year 1927 was stated to have been less than 90 per 1,000 living births as compared with a figure slightly in excess of 98 per 1,000 living births reported for the year 1926 and 151 for the year 1920. The improvement noted was attributed to efficient child-welfare work and personal visits of nurses to more than 800 infants, or more than two-thirds of the total population of under 1 year.

IRAQ

Cholera—December 18-24, 1927.—During the week ended December 24, 1927, 3 cases of cholera were reported in Iraq. The occurrence was in the city of Baghdad.

MADAGASCAR

Plague—November 1-15, 1927.—During the half month ended November 15, 1927, 112 cases of plague with 101 deaths were reported in the island of Madagascar. The distribution according to Provinces was as follows: Antisirabe, 8 cases, with 7 deaths; Itasy, 17 cases with 16 deaths; Moramanga, 7 cases with 6 deaths; Tananarive, 80 cases with 72 deaths, including Tananarive town with 9 cases, 7 deaths. The distribution according to type of disease was: Bubonic, 61 cases; pneumonic, 36 cases; septicemic, 15 cases.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— October 29	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7
China:																
Amoy	C	2	28	72	16											
	D		7	3												
Canton	C	8	31	36	14	5	1	6			1					
	D	5	16	25	14	5	1	5			1					
Foochow	C	P	P	P	P											
Hong Kong	C	2	P	1	P											
	D	1														
Shanghai (cases reported) only in foreigners	C		1	6	3											
	D		20	74	7											
Swatow	C	72	42	P	P	P	P									
	D	1		P	P	P	P									
Tientsin	C	P	P	15	2	P	P									
Dutch East Indies: Java—Batavia	C						1	2	25	2	1					
	D						1	2	15	2	1					
India	C	46,137	45,163	31,390	20,160	5,303	4,845	5,987	6,912							
	D	24,081	22,051	15,895	10,371	2,867	2,641	3,350	4,005							
Bombay	C	75	42	3				2								
	D	35	30	2				2								
Calcutta	C	95	87	76	101	28	35	65	71	186						
	D	48	40	39	64	22	25	42	49	106	77	55	43	48	27	
Madras	C	424	547	59	14			6	7			1				
	D	204	278	48	8			3	4	1		1				
Rangoon	C	2	1	2	6		1		1	3	1	2				
	D	2	1	2	5	1		3	4	2	1	2	1	1	1	
Tuticorin	C				1						6		2			
	D				1	7	5	10	15		6	6	2			
India (French):																
Karikal	C	56	18	1			1									
	D	45	12	1			1									
Pondicherry	C	37	12	15			1				5					
	D	24	11	15			1				5					

Indo-China: Saigon	C			1	1											2
	D															1
Iraq:[1]																
Amarah	C					4	8	3	2		1	1				
	D					6	8	3	2		1	1				
Baghdad	C						10	13	8	3	38			3		
	D						5	2	2	3	38					
Diwaniyah	C					4	3	1	2							
	D					2			1							
Diyala	C										1					
	D										1					
Dulaim	C										1					
Hillah	C					7	3	5	53		7					
	D					6	2	1	29		4					
Kerbala	C					1	4	2	2							
	D					1	5	2	2							
Kut	C					9	1	5								
	D					4	1	3								
Montafiq	C							4	14		8					
	D							2	10		8					
Ramadi	C					19	18	27	21							
	D					10	23	14	16		1					
Japan: Yokohoma	C	1														
	D	1														
Philippine Islands: Manila	C	1	1													
Siam	C	81	77	40	18	14	23	43	30	19	29	18				
	D	59	53	24	11	10	15	25	26	11	19	13				
Bangkok	C	6	2	3	5		1		3		1	1	1	2	3	7
	D	1	1	1	3		1		1		1		1	2	1	3
Straits Settlements: Singapore	C					1		4	2	1	2		2	3	12	3
	D					1		4		2			2	1	3	5
On vessel:																
S. S. Adrastus: At Yokohoma, Japan	C		1													
	D		1													
S. S. Tabaristan: At Basra, Iraq	C				1											

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927		
						1-10	11-20	21-30	1-10	11-20	21-31
Indo-China (French):											
Annam	C	911	1,628	640	167	13	75	38	16	2	
Cambodia	C	87	89	75	102	56	1	28	21	12	39
Cochin-China	C	257	68	144	91	21	27	52	17	38	58
Laos	C	20	190	16	35	10					
Tonkin	C	1,093	180	24				1			2

[1] From July 24 to Oct. 22, 1927, 926 cases and 677 deaths were reported in Iraq. Of these, 166 cases and 126 deaths occurred in Amarah; 417 cases and 337 deaths in Basra; 81 cases and 47 deaths in Diwaniyah; 19 cases and 12 deaths in Hillah; 34 cases and 21 deaths in Kerbala; 8 cases and 6 deaths in Kut; and 185 cases and 118 deaths in Muntafiq.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27 1927	Aug. 28-Sept. 24 1927	Sept. 25-Oct. 22 1927	Week ended— October 29	November, 1927: 5	November, 1927: 12	November, 1927: 19	November, 1927: 26	December, 1927: 3	December, 1927: 10	December, 1927: 17	December, 1927: 24	December, 1927: 31	January 1928: 7
Algeria: Oran	C		4	1			1		1							
	D		3	1												
Argentina:																
Bahia Blanca District	C									1	1	1				
Cordoba Province	C		2		P	P	P			10				1	1	
Entre Rios	C		5													
Firmat	C												1			
Quilino	C									1	1	1				
Rosario	C									1	1	1	1	2	3	
Unacha	C												1			
Azores: St. Michaels Island	C	2	2	2	3	1		1	1	1	1	1		1		1
	D			1	1							1				
British East Africa:																
Tanganyiki	C	P	P		P	P	P									
Ucanda	C	528	456	226	99											
	D	413	345	158	88											
Canary Islands: Las Palmas	C				9					1			2			2
Ceylon: Colombo	C		1	3	1					1	1					1
	D			3												1
China:																
Amoy	C	P														
Tungliao	D				200											
Tientsin	C		2													
Dutch East Indies:																
Balik-Papan	C													1		
	D													1		
Cheribon	C										1					
	D										1					
Batavia and West Java	C	40	71	68	130	41	29	31	34	45	43	32				
	D	40	71	68	129	41	29	31	34	44	43	32				
East Java and Madura	C	29	28	18	17	3	4	2	1	5	3					
	D	29	27	18	17	3	4	2	1	5	3					
Java	D			432	779	191	218									
Makassar	C						2	2	2	1		1		2	1	
	D						2	2	2	1		1		2	1	

Egypt:																
Alexandria	C		2	1						5	3	2	2	3		
	D									5	2				1	
Suez	C			1												
Greece:																
Athens and Piraeus	C		1	3	1											1
	D				1											
Mitylene	C		1	5	1	1		2		1	1	1				
Patras	C		2	2	1		1									
	D				1		1									
Hawaii Territory: Hawaii	D		1													
India	C	404	1,391	2,710	3,246	812	1,015	856	919	1,193						
	D	241	836	1,428	1,792	495	551	485	554	668						
Bombay	C	14	14	7	4											
	D	13	11	5	3											
Calcutta	C			18											1	
	D			10												
Madras	C	255		465	583		83	152		190						
	D	115		230	298		54	80		111						
Rangoon	C	21	15	6	11	5	2		4	5	2	6				
	D	20	14	6	11	5	2		4	5	2	5		2	3	
Indo-China: Saigon	C			2					1							
Senegal:																
Baol	C	41	23	72	95				P		P					
	D	22	13	33	40											
Cayor	C	126	22	463	176	32	8	8	P							
	D	74	166	233	88	20	4	4								
Dakar	C	67	46	20	1											
	D	41	32	12												
Louga	C			5	8											
	D			4												
M'Bour	C	28														
	D	23														
Rufisque	C	104	44	16												
	D	82	38	12												
Thies	C	7		9	1	1										
	D	3		7												
Tivaouane	C	43														
	D	29														
Siam	C				13					2						
	D				9		1			1						
Bangkok	C				2											
	D						1									
Straits Settlements: Singapore	C								1							
	D								1							
Turkey: Constantinople	C			1	1					1	1					
	D				1						1					
Union of South Africa:																
Cape Province	C											2				
	D					2						1				
Orange Free State	C	4							1	8	P					
	D	4							1	6						

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— October 29	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7
U. S. S. R.:																
Chita District	C				1											
	D				1											
Northern Caucasus	C			14	1											
	D			10												
On vessel:																
At La Plata, from Rosario Argentina	C														1	
S. S. Aghios Gerasimos at Vigo, Spain	C								3							

Place		July	August	September	October	November	December
Algeria: Algiers	O				2		
British East Africa: Kenya	C	13	61	21	18	28	
Ecuador: Guayaquil	C	5	7	3	4	9	5
	D					3	2
Indo-China (French)	C			14	3	3	
Madagascar	C	46	98	170	160		
	D	43	89	154	155		
Ambositra Province	C	6	1		6		
	D	6	1		6		
Antisirabe Province	C		34	5	19		
	D		34	4	19		
Itasy Province	C	14	11	21	16		
	D	14	7	20	15		
Madagascar—Continued.							
Moramanga Province	C	5	4	3	24		
	D	5	4	3	20		
Tananarive Province	C	21	48	142	99		
	D	19	43	127	93		
Mauritius	C			1			
Peru	C	8	11	15	14		
	D	7	6	6	5		
Callao	D	3					
Lima	D				1		
Syria: Beirut	C			1	1		

Indo-China (French), 3 cases, Dec. 11-20; Beirut, Syria, 1 case, Dec. 1-10.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	October 29	Week ended— November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21
Algeria	C			382	683		294	218	149									
Algiers	C												3	3				
Oran	C	14	9	16	11		10	4	6	9	11	10	9	8	15	2		
Arabia: Aden	C	2							1		1		1					
	D	1																
Brazil:																		
Para	C		1															
Rio de Janeiro	C	4	6	10		1												
	D	4	4	9		1												
British East Africa: Tanganyiki	D		21	8	P	P	P											
British South Africa:																		
Northern Rhodesia	C	48	53	39	164	150	10	22	3	57	15	125						
	D	2	1	2	11	40	23		1	18	7							
Southern Rhodesia	C								3									
Canada:																		
Alberta	C	42	17	17	23	6	2	1	1	7	3	3	6		3	3	5	1
Calgary	C	5	1															
Edmonton	C				1	1				6		1	1			3	2	
British Columbia: Vancouver	C			2								4		1	3	3	1	
Manitoba	C		13	9	7	3	14		2	1	3	1	2	2	2	2	5	
Winnipeg	C	3	5	4	2				2			1	1	1			1	1
New Brunswick	C			2										1				
Nova Scotia	C			1	1													
Halifax	C				1													
Ontario	C	63	60	22	96	64	38	77	85	71	90	82	104		53	83	76	52
Hamilton	C										2							
Kingston	C								1					1				
Ottawa	C	37	27	40	67	47	17	51	19	10	19		34	18	9	20	23	20
Toronto	C	5		2	10	2	16	3	13		25	14		7		11	10	
Windsor	C				9													
Quebec	C	12	1		8	7	3	12	3	8	5	3		14	3	10	17	7
Montreal	C							1						1		1	6	3
Quebec	C										2		2				3	
Riviere du Loup	C								3									
Saskatchewan	C	25	14	68	31	5	12	2	14	9	15	19	15	12	13	15	12	39
Moose Jaw	C		10	16	3													
Regina	C	2	8		5			1										
Saskatoon	C											2			4			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— October 29	November, 1927 5	November, 1927 12	November, 1927 19	November, 1927 26	December, 1927 3	December, 1927 10	December, 1927 17	December, 1927 24	December, 1927 31	January, 1928 7	January, 1928 14	January, 1928 21
Ceylon: Colombo	C		1								1							
	D		1															
China:																		
Antung	C	3																
Canton	C			1														
	D			1														
Chefoo	C			1	P					P								
	D			1														
Foochow	C	P	P	P	P		P			P								
Hong Kong	C	3	1	2														
	D	3	1	2														
Manchuria—																		
Changchun	C	4								1								
Dairen	C				1		2											
	D				1													
Fushun	C	1		1				1										
Harbin	C	1											2					
Mukden	C	3			2	1												
Pensihu	C	1			1													
Tientsin	C	11		4	13	8				4	1							
Dutch East Indies:																		
Batavia and West Java	C	2	4		4			25										
	D							15										
East Java and Madura	C	8	4	22	8	1	3	5		4	3							
	D				1													
Egypt	C	4		3							4							
	D			1	1							1						
Cairo	C										1							
Great Britain:																		
England and Wales	C	721	568	508	473	199	219	258	226	233	366	230	212	255	247	275		
Birmingham	C		1		1													
Bradford	C					1	5	3	2	9	6							
Bristol	C				6	1			3	2	4	2						
Cardiff	C					1										1		
Leeds	C	2	5	3	7	1	1	1	2	3	3	6	4	4	6	1		

Manchester	C				3		1	1	4	2	5	10	8		1	2		
Newcastle-upon-Tyne	C	1	1	2	6	2	6		1	28	18	5	4	2	13	2		
Sheffield	C	11	2	1	10	4			2	1	8			3		1		
Stoke-on-Trent	C		1													1		
Greece: Saloniki	D	1	2															
Guinea: (French), Beyla	C	9																
India	C	11,340	5,911	4,398	3,153	779	805	1,235	1,233									
	D	3,140	1,668	1,120	715	190	200	211	326									
Bombay	C	38	33	12	10	2			4				4					
	D	21	19	8	2	2			1									
Calcutta	C	93	27	22	5				5	4	3	11	7		17			
	D	70	25		6				2	2	1	6	2		17			
Madras	C	4	6	7	8	3		2	2	2	2	5	2	2				
	D	1		2		1		1		1	1	1		1				
Rangoon	C	37	14	9	17	4		1	1	5	2	1			28			
	D	11	3	2	3	1				1	1				13			
India (French):																		
Karikal	C	2	3	1	2													
	D	2	3	1	2													
Pondicherry	C	22	39	37	38													
Indo-China: Saigon	D	20	31	37	38													
	C	1	1	1														
Iraq:																		
Baghdad	C			1	7			5		1	5							
	D			1	4			4			5							
Basra	C	1	1	4	2				3						2			
	D	1	1	4	2				1						1			
Italy: (Rome and vicinity)	C	1		1														
Jamaica (outside Kingston) (alastrim)	C	15	6	9	9	7				1		1	1		2			
Kingston	C			3	2													
Japan: Nagasaki	C	17	2															
	D	5	1															
Mexico	D	93	73															
Acapulco	C			2				1										
	D			2				1								1		
Chihuahua	D																	
Guadalajara	D									1							1	
Manzanillo	D																	
Mexico City and surrounding territory	C									1	1	1	1					
Monterey	C	6																
	D	4																
San Lois Potosi	D	4	1															
Torreon	D		1		2													
Palestine: Jerusalem	C										1							
Paraguay	D	2																
Persia: Teheran	D	2																
Poland	C	7	2															
	D	2	1															
Portugal:																		
Lisbon	C	4		3	8	1	2				1							
Oporto	C			1														

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended—												
						October 29	November, 1927				December, 1927					January, 1928		
							5	12	19	26	3	10	17	24	31	7	14	21
Siam	C	34	51	27	6				1		8							
	D	9	10	15														
Bangkok	C	5		3					1		1							
	D	1		1														
Spain:																		
Malaga	D								1	1								
Valencia	C				1										1	1		
Straits Settlements: Singapore	C							1										
Sumatra: Medan	C		1										3					
	D												2					
Union of South Africa:																		
Cape Province	C	P	P		P													
Orange Free State	C		P						P	P	P	P						
Transvaal	C				P	7												
Venezuela: Maracaibo	D	1		2	1													

Place		September, 1927			October, 1927			November, 1927			December, 1927		
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31
Algeria	C	110	162	110	182	386	115						
Oran	C	4		12	6		5						
Indo-China	C	6	6	9	5	4	16	13	3	22	10		
Syria:													
Beirut	C										1		1
Damascus	C		1	4	14	8			13		4	6	

Place		July	August	September	October	November	December
Angola	C	42	2	5	73		
	D				2		
Congo	C			5	77		
Cuanza-Norte	C			1			
Cuanza-Sul	C				2		
Loanda	C			1			
Zaire	C			3	4		
Brazil: Porto Alegre	C	5	3	3	4		
British East Africa: Zanzibar	C				2		
	D				1		
Chosen	C	19	2				
	D	6					
Ecuador, Guayaquil	C		2	2	1	1	4
France	C	23	6	8	7	4	
Gold Coast	C	1	1	5			
Greece	C	3	3	4	4		
Latvia	C				2		
Mexico	D	93	73	55			
Morocco	C	53	76	51	81		
Nigeria	C	492	91	237			
	D	83	20	70			
Spain: Madrid	D					1	
U. S. S. R.:							
Railways, etc.	C	11	6				
Other territories in Europe	C	146	111				
Transcaucasus, Siberia, and Central Asia	C	36	29				
Ukraine	C	16	4				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct 22, 1927	Week ended— Oct. 29	November, 1927 5	12	19	26	December, 1927 3	10	17	24	31	January, 1928 7	14
Bulgaria: Sofia	C				17	3	1	2					1	1	4	1	
	D						1										
Chile:																	
Antofagasta	D				1												
Talcahuano	D	1															
Valparaiso	C	2		1				1		1	1						
	D		2	1				1	1								
China:																	
Manchuria—Harbin	C	3	2					1									
Tientsin	C	1		2													
Egypt	C	24	2		12		4			1	7	3		1			
	D	1	3		5						5	1					
Port Said	C				1						1						
Ireland (Irish Free State):																	
Cork County	C	1										3				1	
Donegal County, Letterkenny	C				4												
Mexico:																	
Guadalajara	D									1							
Mexico City, including municipalities in Federal district	C	16	17	19	18	9	6	2	11	7	6	4		4	4	4	3
	D						2						1	1	3	1	
Palestine:																	
Haifa	C		4		2				1	1							
Herzliah	C									1							
Jaffa	C		2		1					1							
Nazareth	C	1	2							1							
Safad	C	1	2							1		1					
Tel-Aviv	C		1	1	2				1	1	1						
Poland	C	99	50	35	19	35	12	6	11	13	28	17					
	D	10	6	2	4	6	3		2	1	5						
Portugal: Oporto	C		1			1								1			
Rumania	C	27	36	16	17				2	6	8						
	D	4	1		2												
Syria: Aleppo	C			2													

Tunisia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]					[illegible]	[illegible]			
Union of South Africa:																	
Cape Province	C	P	P	P	P		P	P	P	P	P	P					
Natal	C	P	P	P	P		P	P	P	P	P	1					
Orange Free State	C	P			P							P					
Transvaal	C	18	1		5		P	P	P	P	P						

Place		1927				November, 1927			December, 1927	
		July	August	September	October	1-10	11-20	21-30	1-10	11-20
Algeria	C	67	33	10	12					
	D	13			1					
Algiers	C	2	2	6	2					
Bulgaria	C	12	24	7	2					
	D		1	2	1					
Morocco	C	148	76	7	11	5	14	7	5	6

Place		July	August	September	October	November
Argentina	C					1
Chosen	C	72	17			
	D	8				
Chemulpo	C	1	2			
Gensan	C	2				
Seoul	C	2	3		2	
	D	1			1	
Czechoslovakia	C	6				
Greece: Athens	C	1		2		
Japan	C	1				
Latvia	C	6				
Lithuania	C	44	18	7	9	18
	D	5	8	1	1	1
Mexico	D	12	38	14		
Peru:						
Arequipa	D		2	1	2	
Lima	D	8				
U. S. S. R.:						
Railways, etc	C	36	22			
Transcaucasus, Siberia, and Central Asia	C	79	69			
Ukraine	C	96	85			
Other territories in Europe	C	732	552			
Yugoslavia	C	11	9		1	1
	D	4	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C, indicates cases; D, deaths; P, present]

Place		Week ended—																
		September, 1927				October, 1927				November, 1927				December, 1927				
		3	10	17	24	1	15	22	29	5	12	19	26	3	10	17	24	31
Belgian Kongo: Boma and Matadi	C																	7
Dahomey: Grand Popo	C												1					
	D												1					
Ivory Coast	C																1	
	D																1	
Liberia: Monrovia	C		1															
Nigeria	C			2														
	D			2														
Senegal	C					5		5	9	16	6	7						
	D					5		4	8	10	4	6						
Dakar	C			P					3	6		5	2	1	4			1
	D								2	4		4	2	1	4			1
Geoul	C					1												
	D					1												
Goree, island of	C	2																
	D	2																
Kebener	C						1	1										
	D						1	1										
Kelle	C						2		1									
	D						1		1									
Keur Samba Kane	C								1	1								
	D										1							
Keur Madiop	C								1									
	D								1									
Khombole	C					1						1						
	D					1						1						
Louga	C					1			2	1	1							
	D					1			2	1	1							
Mekhe	C							1	1	2	2							
	D								1	1	1							
M'Dande	C							1		2	1							
	D							1		1								
Pout	C				1													
	D				1													
Rufisque	C						1											
	D						1											

St. Louis	C					1												
	D					1												
Sebikotane	C							1		2	1							
	D							1			1							
Thies	C			1	2	1		1	1	2	1	1						
	D			1	2	1		1	1	2	1	1						
Tiaroye	C	1																
	D	1																
Tivaouane	C		1															
On vessel S. S. Desirade, at Leixoes, Portugal	C			1														
	D			1														

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

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SPECIAL ARTICLES

UNITED STATES
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1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PREVALENCE OF DISEASE

PUBLIC HEALTH REPORTS

VOL. 43 FEBRUARY 17, 1928 NO. 7

HEALTH CONDITIONS IN THE UNITED STATES, OCTOBER, NOVEMBER, AND DECEMBER, 1927

PREVALENCE OF DIPHTHERIA, INFLUENZA, MENINGOCOCCUS MENINGITIS, POLIOMYELITIS, SCARLET FEVER, SMALLPOX, AND TYPHOID FEVER

The preliminary reports of the prevalence of communicable diseases and the incomplete mortality data available for the fourth quarter of the year 1927 indicate in general unusually good health conditions in the United States. The general death rate was low as compared with previous years. The weekly death rates in large cities, compiled by the Bureau of the Census and published in the Public Health Reports, averaged about 2 per cent lower during these months than they did during the same months in 1926, and the figures for the quarter in 1926 were low. The large industrial insurance companies also experienced low death rates during the last three months of 1927.

In the comparisons given below of the reports for the years 1925, 1926, and 1927, preliminary telegraphic reports, received weekly from State health officers, are used for all three years. Final figures for 1927 are not yet available.

DIPHTHERIA

The increased prevalence of diphtheria which was noted during the first three quarters of the year 1927 continued during the fourth quarter. The number of cases reported in 1927 was greater than the number in 1925 or 1926, but the 1927 diphtheria rates are low when compared with the rates of a few years ago.

Comparisons of the case and death rates for diphtheria for the years 1916 to 1926, inclusive, were published in the Public Health Reports of October 7, 1927, page 2444.

During the last 13 weeks of the years 1925, 1926, and 1927, 37 States, with a population of about 90,500,000 in 1927, reported cases of diphtheria as follows:

	Cases
1925	22, 081
1926	26, 564
1927	27, 414

INFLUENZA

During the last 13 weeks of the years 1925, 1926, and 1927, 28 States reported cases of influenza as follows:

	Cases
1925	6, 972
1926	7, 777
1927	6, 747

These States had an aggregate population of about 62,800,000 in 1927.

The death rates for influenza and pneumonia are frequently relied upon to show the prevalence of influenza, as many cases of this disease are not reported. Weekly reports from 101 cities show an average death rate from influenza and pneumonia combined for the last 13 weeks of 1927 about 9 per cent below the average for the same period of 1926. The 1927 figures were lower than the 1926 figures for each of the 13 weeks except two.

MENINGOCOCCUS MENINGITIS

During the fourth quarter of 1927 more cases of meningococcus meningitis were reported than were reported during the same period of 1925 or 1926. It is possible, however, that some of the increase may be due to better reporting during 1927. The figures for 37 States for the 13 weeks from October 2 to December 31, 1927, and the corresponding period of the years 1925 and 1926, are as follows:

	Cases
1925	275
1926	364
1927	574

POLIOMYELITIS (INFANTILE PARALYSIS)

The 1927 epidemic of poliomyelitis reached its peak in September, but the incidence of the disease continued higher than usual until the end of the year.

Thirty-eight States, with an aggregate population of about 93,000,000, reported cases of poliomyelitis during the last 13 weeks of the years 1925, 1926, and 1927 as follows:

	Cases
1925	1, 124
1926	542
1927	3, 277

During the four weeks ended December 31, 1927, Massachusetts reported 55 cases of poliomyelitis; Ohio, 20 cases; Texas, 18 cases; and Illinois, 15 cases.

These figures are small as compared with those reported a few months earlier, but they are large for the month of December, and show that the effects of the increased prevalence lingered in widely

separated localities unusually late. On the Pacific Coast, where the seasonal prevalence of poliomyelitis is somewhat different from that elsewhere, California reported 64 cases of poliomyelitis during the last four weeks of December; Oregon, 43 cases; and Washington, 26 cases. In all of the States named above the incidence of the disease decreased during December.

SCARLET FEVER

During October, November, and December, 1927, the number of cases of scarlet fever reported to the Public Health Service was almost the same as the number reported for the same period of the year 1925, but the figures are somewhat smaller than they were for these months in 1926.

Thirty-seven States, having a population of about 90,500,000 in 1927, reported cases of scarlet fever for the last 13 weeks of the years 1925, 1926, and 1927, as follows:

	Cases
1925	33, 253
1926	38, 865
1927	33, 131

SMALLPOX

During the last 13 weeks of the year 1927, smallpox was more prevalent than it was during the corresponding period of 1925 or 1926. This condition is the result of neglect of vaccination, for it is possible to control smallpox by vaccination and revaccin tion.

The geographical distribution of the cases is very far from being uniform. As usual, the New England and Middle Atlantic States, with large and dense populations, had comparatively few cases of this disease.

The following table shows, by geographical groups of States, the numbers of cases of smallpox reported for the last 13 weeks of the years 1925, 1926, and 1927, by the State health officers of 38 States, with an aggregate population of about 93,000,000:

Smallpox cases reported for 13 weeks of 1925, 1926, and 1927 (October 2–December 31, 1927)

Geographic divisions	1925	1926	1927
New England	0	0	3
Middle Atlantic	5	162	94
East North Central	1, 054	1, 431	1, 427
West North Central	606	688	1, 729
South Atlantic	263	1, 065	507
East South Central	290	161	102
West South Central	302	533	727
Mountain	135	289	369
Pacific	1, 268	793	741
38 States	3, 923	5, 122	5, 699

TYPHOID FEVER

The preliminary figures for the year 1927 indicate that when the record is complete the typhoid fever case rate for that year will probably be the lowest ever recorded in the United States. The case rates and death rates for typhoid fever have been decreasing since comparable general statistics have been compiled.

The following table gives the annual typhoid fever case rates per 100,000 from 1917 to 1927, inclusive. These rates are based on the reports to the Public Health Service by State health officers, and the 1927 rate is based on preliminary reports.

Typhoid fever case rates per 100,000 population, 1917 to 1927, inclusive

Year	Number of States included	Cases per 100,000 population	Year	Number of States included	Cases per 100,000 population
1917	35	64	1923	47	32
1918	37	51	1924	45	33
1919	36	43	1925	46	42
1920	41	38	1926	46	36
1921	45	47	1927 (provisional rate)	36	26
1922	46	34			

During the last 13 weeks of 1925, 1926, and 1927, 36 States, having a population in 1927 of about 88,000,000, reported cases of typhoid fever as follows:

	Cases
1925	7, 912
1926	7, 574
1927	5, 600

POLIOMYELITIS IN THE UNITED STATES, 1927

During the year 1927 the incidence of poliomyelitis in the United States was higher than it was during any other year since 1916, when a widespread epidemic of the disease occurred.

The following table gives the poliomyelitis case rates per 100,000 population for the thirteen years from 1915 to 1927, inclusive. These rates are based on reports made to the Public Health Service by State health officers. The reports are not complete for any year, and the 1927 rates are based on preliminary figures, but the data appear to be sufficient to show general trends.

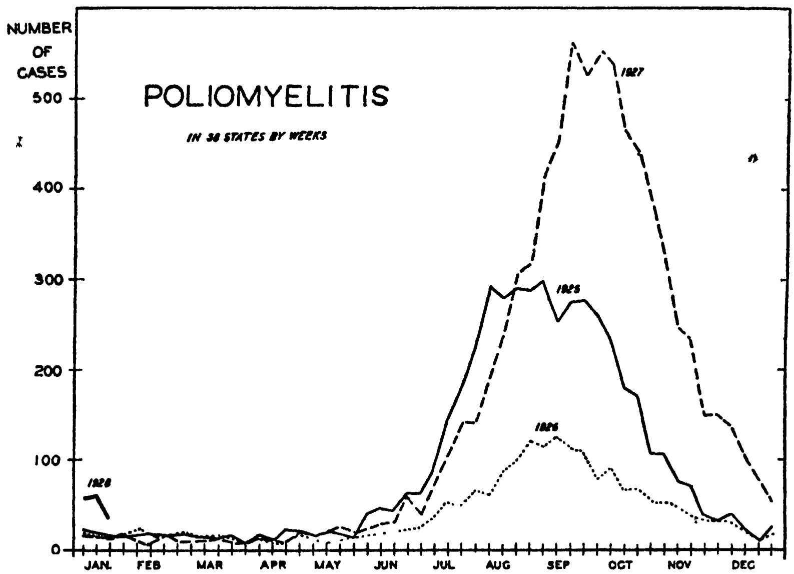
Poliomyelitis case rates per 100,000 from 1915 to 1927, inclusive

Year	Number of States included	Cases per 100,000 population	Year	Number of States included	Cases per 100,000 population
1915	22	3. 1	1922	39	2. 4
1916	27	41. 4	1923	40	3. 4
1917	30	5. 4	1924	38	5. 7
1918	34	2. 9	1925	44	5. 6
1919	32	2. 4	1926	40	2. 5
1920	36	2. 8	1927 (preliminary reports)	38	8. 4
1921	42	6. 9			

Weekly telegraphic reports from the State health officers of 38 States are available for the years 1925, 1926, and 1927. The aggregate population of these States was about 89,000,000 in 1925, 91,800,000 in 1926, and 93,000,000 in 1927. The accompanying chart shows graphically, by weeks, the numbers of cases of poliomyelitis reported by these 38 States for the three years and also for the first three weeks of 1928.

The aggregate numbers of cases of poliomyelitis reported for 52 weeks of each year are as follows:

1925	4, 903
1926	2, 074
1927	7, 784



Number of cases of poliomyelitis reported, by weeks, by 38 States for 1925, 1926, and 1927, and for the first three weeks of 1928

The chart shows that the aggregate number of cases reported was not sufficient to give warning of a general epidemic until late in July, 1927, although California, Louisiana, New Mexico, Arizona, and Texas reported more than the usual seasonal rise in the prevalence of poliomyelitis in June and July. This is in sharp contrast with the history of the epidemic of 1916, when New York State reported 345 cases of poliomyelitis in June and more than 4,000 cases in July.

In 1916 the peak of the epidemic was reached before the end of August, except in a few States, while in 1927 the peak was not reached until the middle of September, and the epidemic receded very slowly until after the first week of October.

The geographic distribution of the cases of poliomyelitis was irregular. This appears to be characteristic of the disease. In

1916 about half of the reported cases occurred in the State of New York, although the 26 other States which reported had almost six times the population of New York. In 1927 the States reporting the greatest number of cases were California, Massachusetts, and Ohio.

ELECTRON EQUILIBRIA IN BIOLOGICAL SYSTEMS

I. A METHOD FOR THE CONTINUOUS MEASUREMENT OF THE ELECTRICAL POTENTIAL IN LIVING CELLS

By Carl Voegtlin, *Professor of Pharmacology*, and Floyd De Eds, *Pharmacologist, Division of Pharmacology, Hygienic Laboratory, United States Public Health Service*

INTRODUCTION

All living organisms depend for their continued existence upon an external supply of energy. This energy is furnished in various forms: To plants as solar radiation; to animals almost entirely as so-called food, i. e., chemical energy. The utilization and transformation of this potential energy of food for the various needs of the animal has been and still is a fundamental biological problem. It is well known that this energy is made available by the gradual chemical disintegration of food to the end products of metabolism. Considerable information has accumulated concerning the nature of these complex biochemical reactions and the part they play in biological energy transformations. The interesting studies of Hill and Meyerhof on the energy transformations occurring during and following the contraction of skeletal muscle seem to indicate that the glycolytic process furnishes the energy for muscular contraction and that the energy required for recovery (restitution) is derived from the oxidation to CO_2 and H_2O of about one-fifth of the lactic acid formed during contraction.

In previous papers (1) (2) we have described some observations on spontaneously contracting isolated smooth muscle (guinea-pig uterus) which clearly showed that exposure of the muscle to substances such as glutathione, cysteine, cyanide, etc., produces sudden contractions. As proper precautions were taken to prevent changes in the hydrion concentration of the Locke solution, the contraction could not easily be attributed to changes in this factor. The suggestion was therefore made that the action of the above-mentioned substances is primarily due to their effect on an *oxidative* process of the muscle cells. It was furthermore pointed out that a proper correlation of oxidation-reduction potential and muscular contraction might materially assist in elucidating this problem. It was fully realized that the ideal procedure would consist in correlating muscular contraction with continuous measurements of the oxidation-

reduction potential (time : potential curves) by means of a suitable electrode method. Unfortunately, the conventional method used in physicochemical work could not be applied to the problem under consideration, for reasons which will be given later on. However, through the kindness of Professor Clark, of the division of chemistry of this laboratory, we were supplied with a series of oxidation-reduction indicators whose potentials had been determined by Professor Clark and his colleagues. These indicators and anthraquinone sulphonate (Connant) were used in some unpublished experiments by one of us (V.) with Mr. McClosky for the purpose of shifting the oxidation-reduction potential of smooth muscle and observing the effect on the contraction. Briefly stated, it was shown that the exposure of the muscle to equimolecular concentrations of the different indicators produced effects which could be predicted by the previous work and a knowledge of the position of a given indicator on the electrometric scale. These observations made it imperative to develop a suitable electrode method; for it was obvious that only time : potential curves could furnish the necessary details for a proper appreciation of the potential changes occurring during muscular contraction and relaxation.

Before proceeding with the description of this method it may be advisable to discuss briefly some of the fundamental principles involved in this work.

All forms of energy have a dual nature, being composed of the intensity and capacity factors. In the case of chemical energy,

Chemical energy = chemical potential × equivalent weight.

The chemical potential (intensity factor) is sometimes called the driving force of a reaction. The equivalent weight (capacity factor) is the quantity of a chemical which takes part in the reaction. In the case of electrical energy we have the equation—

Electrical energy = electrical potential × quantity of electricity.

The electrical potential (intensity factor) is measured as electromotive force (volts). Now it has been shown that the electromotive force is proportional to the chemical potential, and the electromotive force can therefore be used as a measure of chemical potential.

The interrelation of chemical and electrical energy is explained by the electron theory, which postulates the transfer of negative electric charges (electrons) in any chemical reaction. This being so we have used the word electron equilibria in the title, so as to bring our results into harmony with modern theoretical chemistry and physics.

The term oxidation has assumed a much clearer meaning in the light of the electron theory. The oxidation of a given element

or substance means simply the loss of one or more negative electric charges (electrons). For instance

$$Fe^{++} - e = Fe^{+++}$$

indicates the oxidation of ferrous ion to ferric ion, e being the symbol for electron.

Similarly, the oxidation of iron to ferrous ion can be written

$$Fe - 2e = Fe^{++}$$

The intervention of either oxygen or hydrogen in oxidations and reductions simply represents special cases of oxidation-reduction. It is possible to measure such oxidation-reduction reactions as

$$FeC_6N_6'''' \rightleftharpoons FeC_6N_6''' + e$$

by means of a suitable electrometric method.

DEVELOPMENT OF METHOD

Accurate potentiometric studies on biological systems are difficult for a number of reasons, but the most outstanding objections to current methods are the inability to follow continuously any potential changes originating within the system being studied, and the inability to follow such changes without drawing current from the system. The first objection means that a series of observations must be made, and the second objection demands that these observations must not be too close together. The second objection also prevents the accurate measurement of potential changes even though they be relative, because the withdrawal of current from the source results in polarization and a disturbance of the capacity factor.

It is one of the objects of this paper to describe an equipment which overcomes these difficulties. The apparatus permits the continuous observation of potential changes in a biological system without the withdrawal of current from the system. The possibility of such an equipment depends upon the modern three-electrode vacuum tube of the present day radio receiving set.

The use of the three-electrode vacuum valve in fields of endeavor other than the science of radio is not new. Höber (3), in 1919, had applied the three-electrode tube in his studies on the amplification of the action current of muscle. Daly and Shellshear (4), in 1920, employed the vacuum tube to amplify the movements of a string galvanometer in electro-cardiographic work. Forbes and Thacher (5) utilized the three-electrode tube to amplify the action currents of the frog sciatic. Gasser and Newcomer (6), in 1921, made use of the same principle in studies of the phrenic nerve. In 1922 Gasser and Erlanger (7) again applied the vaccuum tube in conjunction with a Braun tube for studies on nerve action currents. The chemists, as well as the physiologists, have had recourse to the advantages

offered by the three-electrode vacuum tube. In 1921 Noyes (8) described its use in measurements of the potential in an electrolytic cell for the deposition of iron. Goode (9), in 1922, and again in 1925, discussed the use of the tube in the construction of a continuous reading electrometric titration equipment. Calhane and Cushing (10), in 1923, used a vacuum tube circuit for the accurate titration of dilute salt solutions with silver nitrate. For a somewhat similar purpose Treadwell (11) employed a vacuum tube in 1925.

In all the above-mentioned work the three-electrode vacuum tube proved useful for one or more of the following reasons: Its ability to detect minute fluctuations in potentials, its ability to amplify such changes, and its ability to act in a properly constructed circuit without drawing current from the source under investigation. Before giving a description of the equipment used in studies of electron equilibria in biological systems, a brief description of the manner of action of the three-electrode vacuum tube will be given. For a complete discussion the reader is referred to the text of H. J. Van Der Bijl (12).

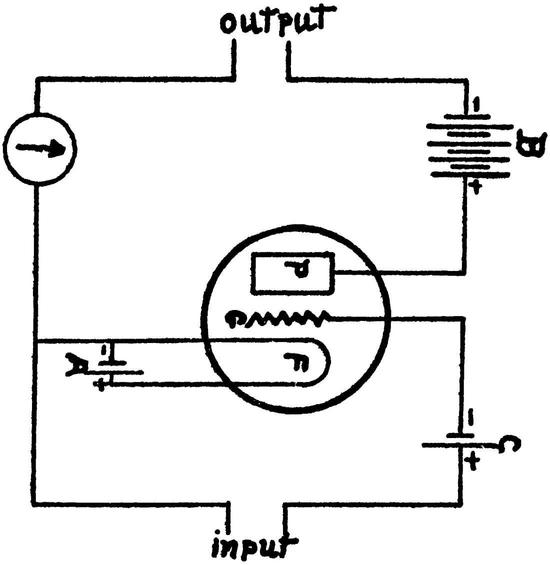


FIG 1 —A=6-volt storage battery; B=plate circuit battery (voltage value dependent upon the tube and its use); C=grid circuit battery (voltage value dependent upon tube and its use); F=filament of tube; G=grid of tube; P=plate of tube; FGG=grid circuit; PB=plate circuit

Input refers to connections leading to the source of potential being measured; output refers to connections leading to recording device.

When the filament F (Fig. 1) is heated by a current from battery A, there occurs an emission of electrons, some of which are drawn to the plate P by the positive charge imposed on plate P by the battery B. The current in the plate circuit is proportional to the number of electrons drawn to the plate and, hence, proportional to the positive charge imposed by B. A grid, G, is placed between the filament F and the plate P. Assuming a constant rate of electron emission from the filament F by virtue of a constant current from A, and assuming a constant positive charge on plate P, it follows that any variation in charge imposed on the grid G will result in an alteration in the number of electrons passing from the filament to the plate, i.e., an alteration in the plate circuit. For example, when the grid G is positively charged, the removal of electrons from the filament is

facilitated, and the current in the plate circuit is increased; but when the grid is negatively charged, electrons are repelled back to the filament, a smaller number of electrons reach the plate, and the plate current is consequently decreased. In other words, under the conditions of constant filament temperature and constant B battery voltage the current flowing in the plate circuit is a function of the current in the grid circuit.

If it is desired to use the tube in such a way that no current will be drawn from the source the potential of which is being measured, certain other considerations are of importance. When the grid becomes positive, there is an attraction of electrons to the grid and a current is set up in the grid circuit, for the resistance of grid circuit is no longer infinite. If, however, the source of potential causing fluctuations in the grid potential is superimposed upon a constant negative potential furnished by battery C, and large enough to keep the grid negative under all circumstances, the resistance of the grid or input circuit will remain infinite and no current will flow. Under these conditions the current in the plate circuit is a function of a variable grid potential, which always remains negative to the filament. This is a circumstance of the greatest importance for the measurement of potentials in biological systems, *for it meets the requirement of measuring potential variations without the withdrawal of currents from the systems of small capacity under investigation.*

Utilizing the principles so far discussed, a two-tube circuit[1] has been devised for the continuous measurement of the voltage changes taking place in spontaneously and rhythmically contracting tissue. The entire arrangement of the equipment is shown diagrammatically in Figure 2. For purposes of detail the vacuum-tube circuit is shown on a much larger scale than are the portions of the diagram relating to the potentiometer and the apparatus for supporting and recording the contractions of the tissue.

The various electrical connections are obvious from the diagram in Figure 2, but a few remarks concerning the choice of parts may be of interest. A single-tube equipment was used in the early part of the investigation, but the two-tube apparatus proved to have a greater range of utility. An equipment may be designed to use almost any type of tube, but in the set here described, storage-battery tubes were used, because a storage battery, preferably the lead type, of large capacity, about 150 ampere hours, supplies a more constant current to the tube filaments than is possible with tubes operated by dry cells. The first stage is supplied with UX 240 tube, because of its high amplification, while the second stage is equipped with a UV 201A. The plate or output circuit of the UX 240 tube feeds

[1] We express our appreciation to Dr. L. H. Adams, of the Geophysical Laboratory of the Carnegie Institution of Washington, for helpful suggestions in planning the two-tube arrangement.

into the grid circuit of the UV 201A tube through a variable ½ meg ohm resistance connected in series with a 22.5-volt C battery, the variable resistance acting as one of the controls for adjustment to maximum sensitivity. The millivoltmeter in the plate circuit of

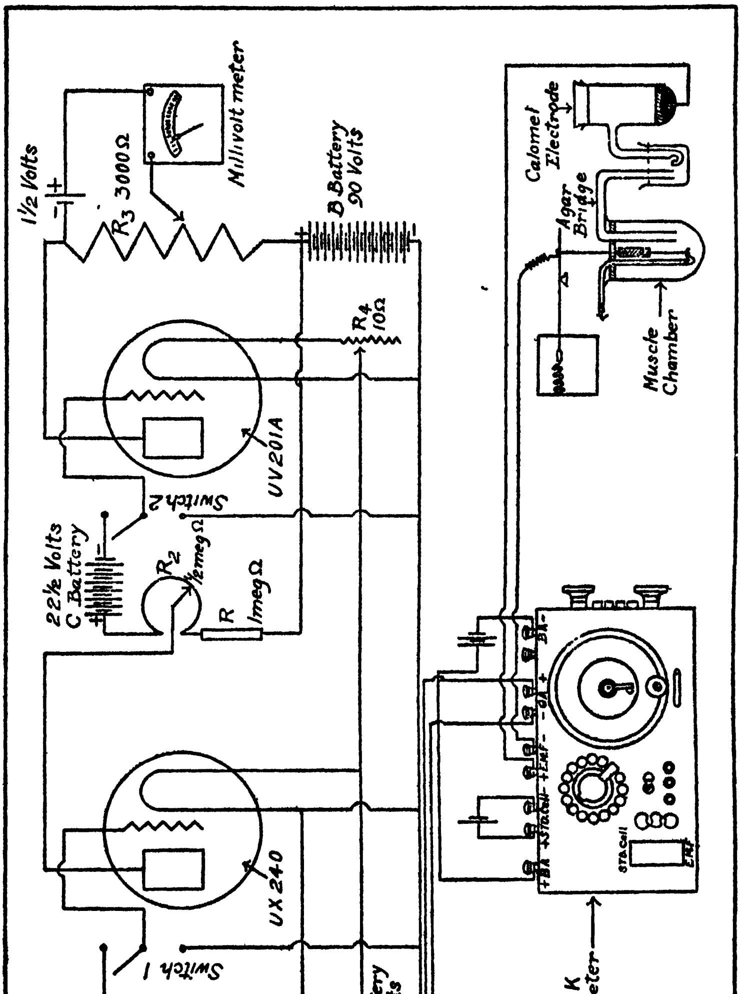


Fig 2.—Diagram showing connections of two tube equipment

the UV 201A tube is shunted by a 3,000-ohm variable resistance which acts as the second control for adjustment of maximum sensitivity.

By proper manipulation of the variable shunt resistance, R_3, and the two single-pole double-throw switches 1 and 2, it is possible to

adjust the apparatus without damage to the millivoltmeter. With switches 1 and 2 in the "down" position and all the resistance in R_3 cut out, the filament current is turned on. Switch 2 is now thrown to the "up" position and the desired zero point of the millivoltmeter adjusted by means of R_2 and R_3. Then switch 1 is thrown to the "up" position and the adjustment of R_2 and R_3 repeated, the sensitivity being greater the larger the amount of resistance used in the shunt R_3. The best results have been obtained with a filament voltage of 5.4, B battery voltage of 90, and C battery voltage of 22.5.

GENERAL CONSIDERATIONS CONCERNING THE APPLICATION OF THE METHOD TO BIOLOGICAL PROBLEMS

From the preceding discussion it is evident that functional changes in biological systems should be reflected by corresponding changes in potential. Furthermore, the selection of rhythmically contracting isolated smooth muscle for testing out the reliability of our new method has been exceptionally fortunate for the reason that the functional change is not complicated by the use of an external stimulus, as would be necessary, for instance, in work on isolated striated muscle. Moreover, the contraction of such smooth muscle as the guinea pig uterus is slow enough to permit a proper correlation of the contraction curve with the potential curve.

In order to determine the potential of the tissue it is of course essential to insert the electrode directly into the tissue. By the use of a careful technique the thin platinum wire electrode can be inserted with the least amount of injury. In fact the technique can be so refined that it should be perfectly feasible to use the method in conjunction with the microtechnique of Chambers for the study of the potential of single cells (ameba, nitella, etc.).

The arrangement for the study of the movements of the isolated virgin guinea pig uterus and segments of the rabbit intestine was essentially the same as that in the previous work (2). The platinum electrode consisted of a 32-gauge wire 5 cm. long. This wire was carefully coated with Bakelite with the exception of 1 mm. at one end (*a*) and 5 mm. on the other end (*b*). The Bakelite formed beads, and these made it possible to tie securely the uncoated end (*a*) of the electrode into the upper lumen of the organ by means of a strong silk ligature. End (*b*) of the platinum electrode was then connected by means of a very thin and very flexible gold wire to a small piece of modeling clay which was located 5 cm. from the fulcrum of a light heart lever. The end of the gold wire was firmly connected with the copper lead to the potentiometer. (Fig. 2.) Special care was taken to have a sufficient length of gold wire between point of attachment and copper lead so as not to interfere in the least with the movement of the lever. The lower end of the muscle preparation was securely

closed by a silk ligature and tied to the lower end of the glass tube through which oxygen was driven through the salt solution in which the muscle was suspended. A layer of liquid petrolatum, 1 cm. in thickness, was placed on top of the salt solution in order to prevent contact of the uncoated gold wire with the saline. The position of the muscle preparation in the bath was such as to insure complete immersion of the muscle in the saline bath at all times. The muscle lever was properly balanced and only sufficient weight was put on the muscle to take up the slack in the metallic and silk leads to the points of attachment.

The same arrangement was used for the experiments with isolated ventricular strips of the turtle's heart. The composition of the frog Ringer solution was as follows: NaCl, 0.6%; KCl, 0.0075%; $CaCl_2$ (anhydrous), 0.1%; $NaHCO_3$, 0.1%.

In the experiments with the turtle's heart *in situ* the platinum electrode was carefully tied into the apex and connected with the heart lever in the usual manner. One end of the agar bridge dipped into a cavity adjoining the heart, which was filled with frog Ringer solution.

A writing point of flexible photographic film was used in order to reduce the friction on the smoked kymograph paper to a minimum.

The voltage changes were read off by one person, and simultaneously recorded on the muscle curve by a second person and entered in the notebook by a third one. With this scheme the error committed in the correlation of potential curve and muscle curve was very small indeed. But it is obvious that continuous automatic registration of the potential curve is very desirable, in fact, essential for work with rapidly contracting organs. Preliminary experiments have shown that this is quite feasible and we shall report on this phase of the development of the method in a subsequent paper.

DISCUSSION OF PRELIMINARY RESULTS

Figure 3 shows a small section of a tracing of the rhythmic contractions (pendulum movements) of a duodenal segment of the rabbit. The lower line indicates time in seconds, up stroke indicates contraction of the muscle, and the figures represent millivolts. It was impossible to follow with the present technique more than the rough outline of the potential changes, but the high voltage value always was reached toward the end of relaxation and the low voltage at about the height of contraction. Attention is called to the great regularity of the potential changes coinciding with these rhythmic contractions, the maximum and minimum value differing only by 9 millivolts.

Figure 5 illustrates similar results obtained with a slowly contracting uterus. The lower line indicates time in seconds, the middle

line time signals of the potential readings, and the figures on the muscle curve again millivolts. The relation between muscle curve and potential curve is still better brought out by Figure 4. Both figures show clearly the relation between spontaneous rhythmic contractions and potential changes. There can be no doubt that the two phenomena are fundamentally related. It appears *that contraction sets in within a short time after the potential begins to fall and the voltage reaches its minimum value at the height of contraction. Then, as the muscle relaxes, the voltage is gradually built up again; and this process repeats itself with each contraction.*

Figure 6 represents one of the tracings obtained with the ventricular strip of the turtle's heart. Time is given in seconds. Here again

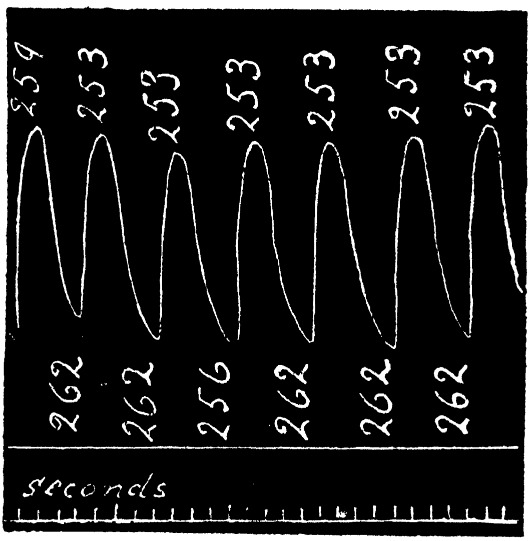


FIG. 3.—Rabbit duodenal segment

the same correlation is found between contraction and potential change.

Figure 7 illustrates a tracing of the turtle heart *in situ*. Time is in seconds. Up stroke represents contraction. During diastole the voltage is without exception 841 millivolts, and during systole 838—a difference of 3 millivolts. During the period indicated by the two arrows the vagus was stimulated by an induction current, with the result that the heart stopped contracting and the voltage increased by 6 millivolts (841 to 847). Twenty-four seconds after the vagus stimulation was stopped, the heart began to contract again and the same loss in voltage accompanying each contraction was again noted.[2]

[2] It appears that the method may furnish an explanation of the electrochemical cause of the electrocardiogram.

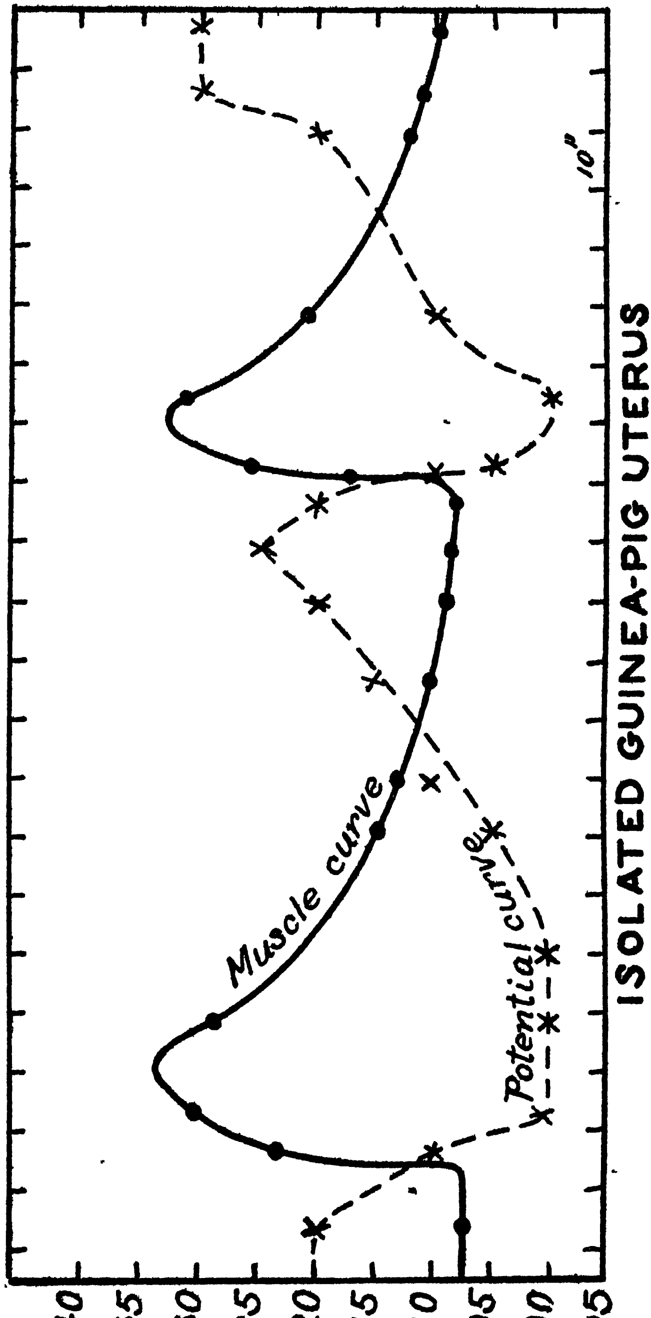


FIG. 4.—Relation between muscle curve and potential curve

Essentially the same situation was met in experiments in which the isolated gastrocnemius of the frog was stimulated through the sciatic nerve by a galvanic current. Here also contraction was accompanied by a loss of a few millivolts and relaxation by a return to the previous voltage.

Figure 8 illustrates an experiment designed to show the effect of changes in load on the potential. Time = 30 seconds. In this particular experiment a guinea pig uterus was put under a load of 3 grams, which is far in excess of the weight that the muscle could possibly lift. The voltage range fluctuated considerably without producing any contractions. At the time indicated by the arrow the muscle was released from the 3-gram weight, with the result that it immediately contracted and the voltage fell gradually from 660 with load to 365 millivolts after the load had been removed.

A similar experiment with the duodenal segment of the rabbit is illustrated by Figure 9. Time = 30 seconds. As far as the spontaneous contractions are concerned, the maximum voltage was always reached with relaxation, and the low voltage at the height of contraction, as in the experiment illustrated by Figure 3. The important new point, however, is the relation of the load to the voltage level. It is obvious that *the voltage level of the spontaneous contractions decreases with a decrease in load and increases with an increase in load.* This appears to be a fact of fundamental importance and is probably explained by the following line of reasoning. The work done by the muscle in lifting the weight during the spontaneous contractions is proportional to the weight if the contraction (distance) is of the same magnitude. In our experiment this is roughly true with the 1.5-gram, 1-gram, and 0.5-gram load. Now, there must be some relation between the chemical energy expended and the mechanical work performed by the muscle and an increase in work can be obtained only by an increased consumption of chemical energy. This latter, as we have seen, is—

$$\text{Chemical energy} = \text{chemical potential} \times \text{equivalent weight.}$$

Now the potential change occurs immediately after reducing the load or increasing it. An increased chemical potential immediately establishes conditions for increased mechanical work, for the potential is the driving force of chemical reactions. We are not in a position to give any information as to the changes occurring in the other work factor—the capacity. But very probably the chemical capacity (equivalent weight), being represented by the chemical constituents of the muscle, is not likely to be subject to such sudden alterations. We shall return to the discussion of this subject in a future communication; but we should like again to draw attention to Figure 8.

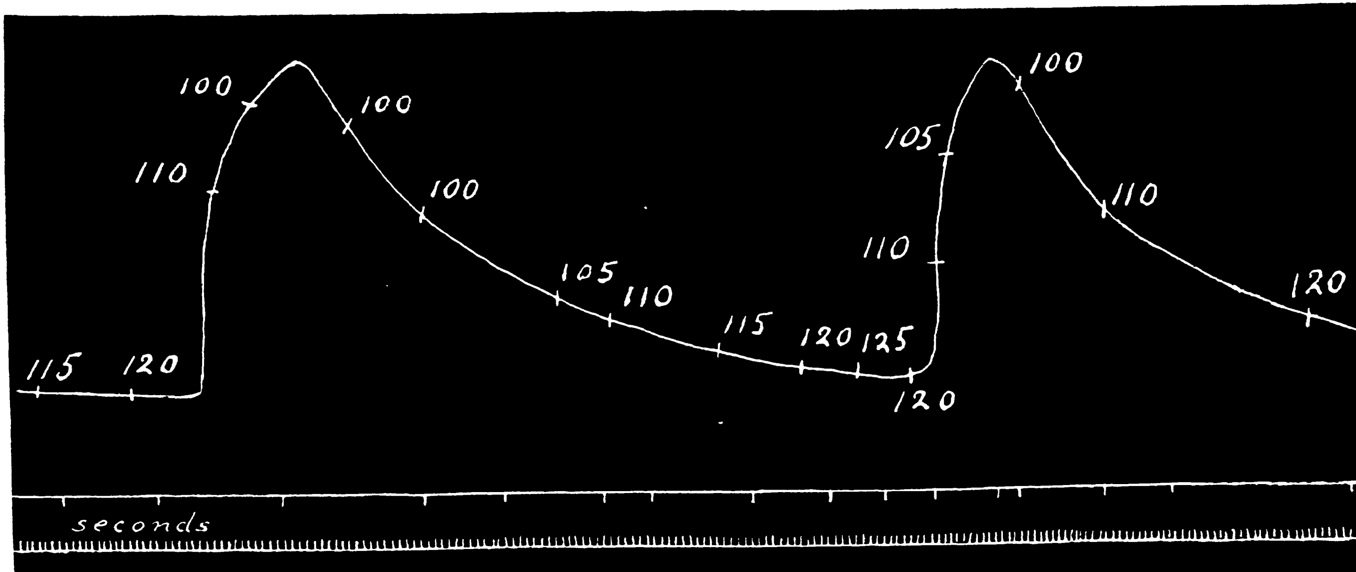
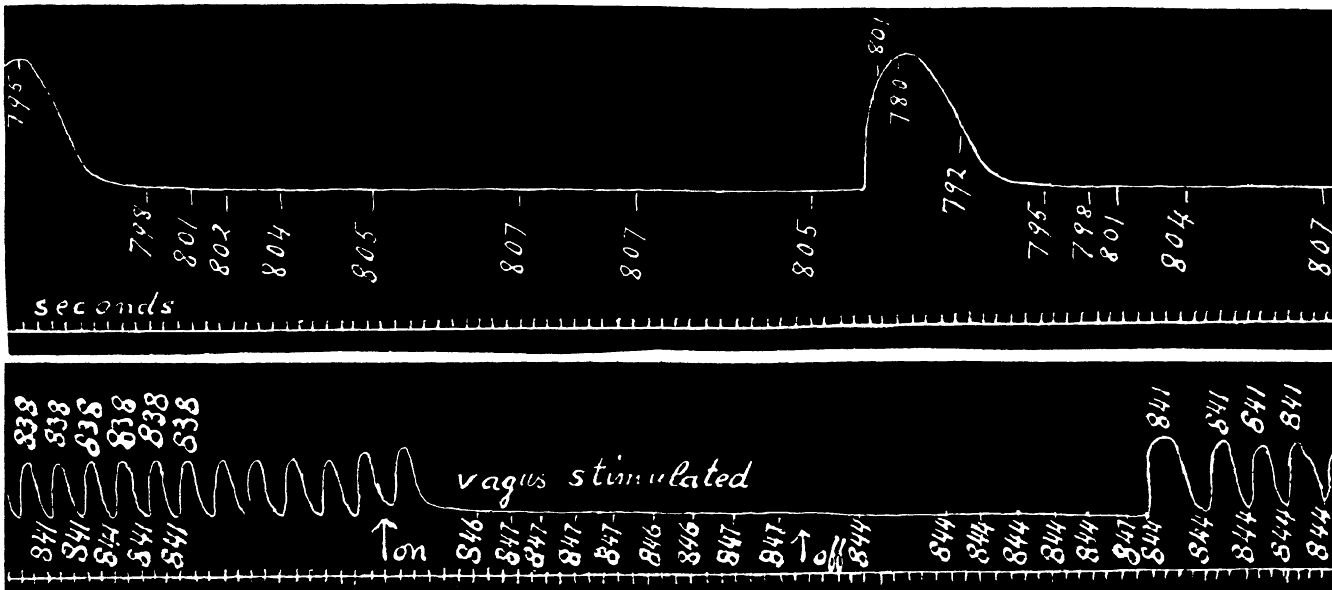


Fig. 5.--Guinea pig uterus. Spontaneous contractions and potential changes



Figs. 6 and 7 —Upper graph is tracing obtained with ventricular strip of turtle's heart, lower shows tracing of the turtle heart in situ

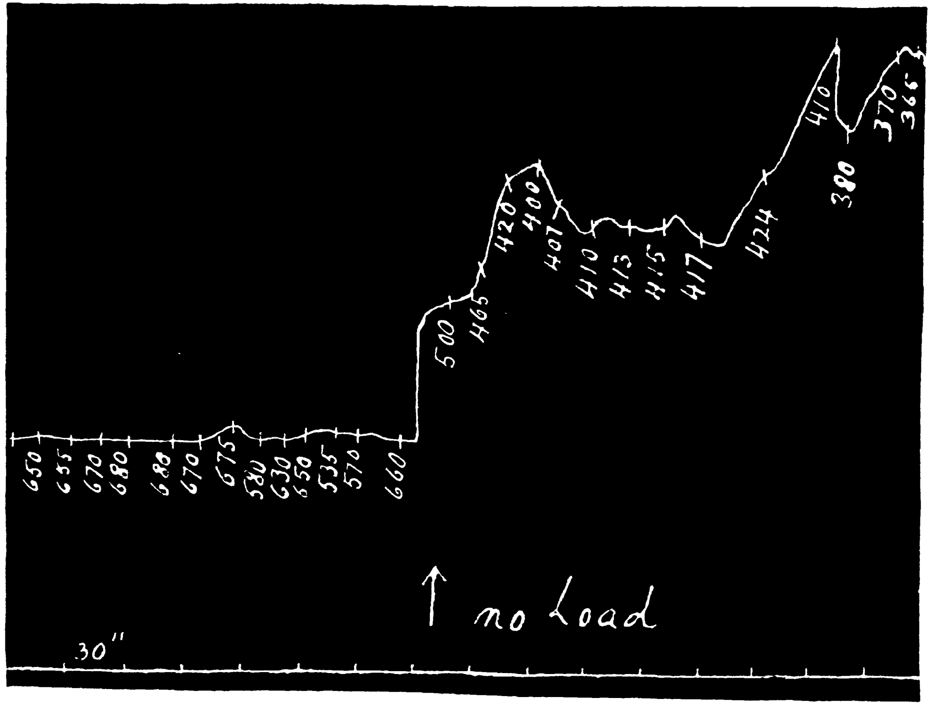


Fig. 8.—Guinea pig uterus. Effect of taking off 3-g. load

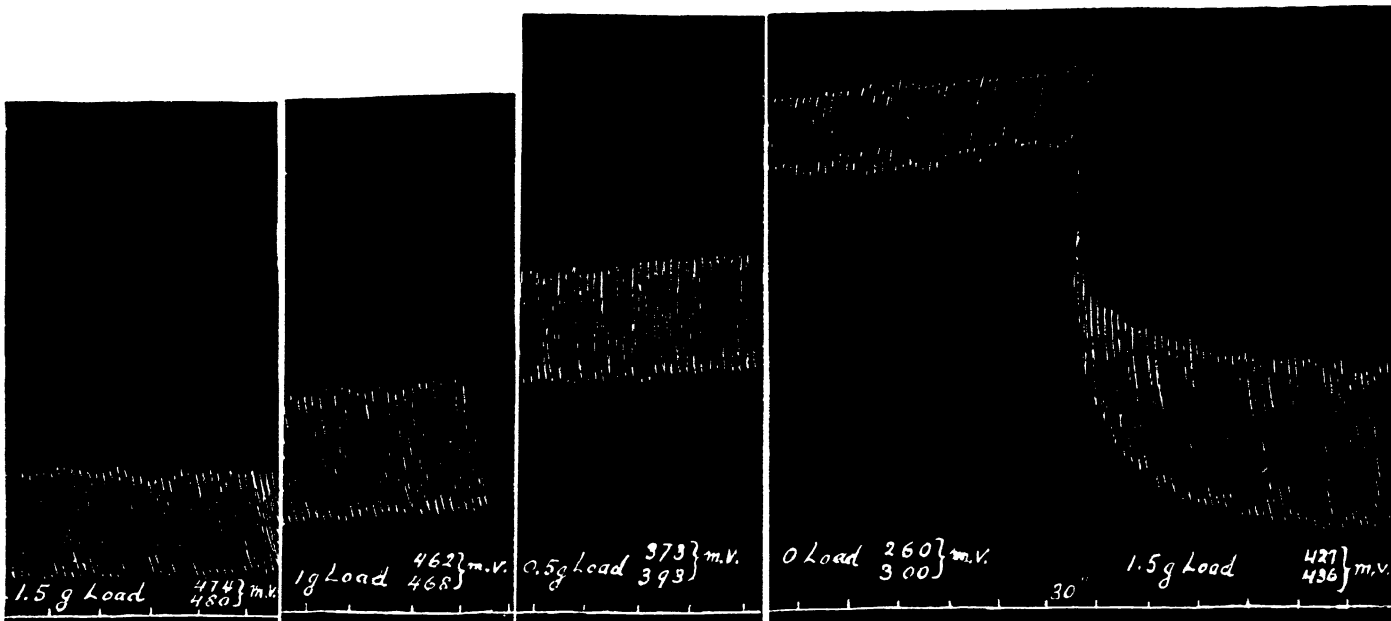


Fig. 9 —Tracing of rabbit duodenal segment Effect of variation of loading

The uterus under an excessive load shows potentials which are very high indeed, although the muscle is not showing any appreciable spontaneous contractions. What is the explanation of this large increase in voltage resulting from heavy loading? The muscle does no external work, but nevertheless it must expend a large amount of energy in maintaining the weight at a given height. It appears that this demand for additional energy is met by the large increase in potential, or, to put it in other words, the "driving force" of the chemical reactions of the muscle tissue is increased.

The results which have been reviewed indicate that our new method reveals with great constancy a relation between potential change and functional change of a great variety of different living structures. We emphasize again that the arrangement does not involve withdrawal of current from the tissue, and, what is equally important, the observations made on the spontaneously contracting muscles are not complicated by the application of an external stimulus. For these reasons we believe that, due to fortuitous circumstances, we have selected the ideal conditions for testing out the reliability of the method for the study of biological problems. The relatively few experiments described throw a new light on muscular contraction, tonus, and physiological rhythm, and electrochemical studies of this sort will assist in the solution of many biologic puzzles.

We have refrained from interpreting the observed potential changes as changes in oxidation-reduction potential. Our equipment, consisting essentially of the set-up, voltmeter—platinum electrode—unknown potential—saline--agar bridge—calomel electrode—voltmeter, can be used to great advantage by the physical chemist for the determination of oxidation-reduction potentials of nonliving systems. Applied to biological systems, however, the method may or may not indicate oxidation-reduction potential pure and simple. The reasons for the justification of this standpoint will be discussed in the next paper. We feel justified, however, in using the method for the study of electrical potential irrespective of any given type of chemical potential which may be involved. In fact, we have been bold enough to use the title "electron equilibria," *because acid-base equilibrium, oxidation-reduction equilibrium, etc., all involve electron equilibria and are therefore interrelated.*[3] It seems, therefore, far better to begin work of this nature from the broadest aspect possible and to proceed then to a more detailed analysis.

It is obvious that the method has opened up a vast field of research in the fundamental medical sciences and in biology in general.

[3] We call attention to the fact that considerable confusion exists in this matter even in the recent literature on physical chemistry. This is due to a lack of proper perspective and the use of improper definitions.

SUMMARY

1. The need for a method for continuously following the electrical potential differences in biological systems is discussed.

2. The three-electrode vacuum tube is briefly described and shown to fulfill the requirements of making possible the measurement of potential changes without the withdrawal of current from the biological system.

3. A two-tube equipment is briefly described and all electrical connections are shown diagrammatically.

4. The basic principles for the applications of the method in biological studies are discussed.

5. Preliminary experiments with spontaneously and rhythmically contracting isolated smooth muscle, heart muscle, and electrically stimulated skeletal muscle indicate that contraction is accompanied by a decrease, and relaxation by an increase, in electrical potential. Rhythmic contractions are correlated with rhythmic potential changes and furnish a new interpretation of physiological rhythm and muscular contraction.

6. The method is suitable for the general study of the relation between function and electrochemical changes in living cells.

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INFANT MORTALITY FROM DIFFERENT CAUSES AND AT DIFFERENT AGES IN NINE CITIES OF THE UNITED STATES [a]

By Selwyn D. Collins, *Associate Statistician, United States Public Health Service*

Infant mortality and its causes continue to occupy an important place in public health discussions. In the birth registration area of

[a] Some of the data included in this paper were originally prepared for and presented by a Public Health Service representative to the Office International d'Hygiène publique.

the United States infant mortality (deaths of infants under one year of age per 1,000 live births) has decreased from 100 in 1915 (the year the birth registration area was organized) to 71 in 1924. This is the remarkable decrease of 29 per cent. The death rate under 1 year of age per 1,000 persons decreased about 32 per cent from 1901 to 1920 in the United States.[1]

Infant mortality in the State of Massachusetts decreased from 170 in 1875 to 68 in 1924, a decline of 60 per cent in the half century.

Similar decreases could be cited for England, New Zealand, and almost any other important country of the world.

In recent years, however, there is a tendency toward a slackening of the decline. The rate for the birth registration area of the United States for the years 1925 and 1926 actually showed slight increases over 1924, the 1926 rate being slightly higher than the 1925. Such a tendency is inevitable as the rate approaches a more or less irreducible minimum—at least irreducible without new methods of attack upon the problem of infant mortality. Inasmuch as there is a tendency toward a slackening of the rate of decline, it behooves public-health workers to analyze the infant mortality more carefully. Two refinements suggest themselves in this matter: We may look more carefully into (*a*) the ages at which infants die and (*b*) the causes of death.

In considering the age group under 1 year as a whole, it may seem that the data have been sufficiently refined with respect to age. However, during the course of the first year a baby about trebles his weight and increases considerably in height. The actual increases in weight and in height from birth to 1 year of age are as great as in the period of rapid growth just before puberty, and the relative or percentage increase in these measurements is far greater during the first year of life than at any other period. The first year is, then, a very long one as judged by the baby's development and changes in his life during the period. Looking at the matter from this viewpoint, infant mortality becomes a very crude measure of what happens to the infant—as crude, comparatively, as the death rate at all ages combined which we have called the "crude" rate in contrast to the "adjusted" rate which takes account of differences in the age distribution of the peoples whose death rates are to be compared.

When all causes of death are considered as a whole, we are considering deaths from diarrhea and enteritis, measles, tuberculosis, etc., which causes appear to be associated with the baby's postnatal existence, together with deaths from premature birth, congenital malformations, etc., which appear to be more closely related to the

[1] Britten, R. H.: Some Tendencies Indicated by the New Life Tables. Pub Health Rep, vol 39, No. 15, Apr. 11, 1924. (Reprint No. 912.)

prenatal period of the baby's life than to anything which takes place after its birth.

What, then, is happening to the death rate of infants under 1 week of age, 1 week to 1 month of age, and 1 month to 1 year; and what is happening to the death rate from premature births, congenital malformation, etc., as compared with the death rate from diarrhea and enteritis and infectious diseases?

TREND IN INFANT MORTALITY

In Figure 1 infant mortality rates for Massachusetts, New Zealand, and the United States registration area [2] have been plotted on a semilogarithmic chart to indicate the trend. On such a chart an equal distance vertically represents an equal relative or percentage change in the rate, and the slope of the line, therefore, indicates the proportional change in the rate. The top continuous line in Figure 1 represents the total infant mortality under 1 year of age in Massachusetts from 1870 to 1926. The dotted line at the top shows the same rate for the whole United States birth registration area since its organization in 1915. The two rates are very nearly the same, and the Massachusetts data may be assumed to represent fairly well the trend in the United States. The New Zealand total infant mortality rate is much less than that in Massachusetts or in the United States birth registration area and has been less during the past 50 years; but the general trends of the New Zealand and the Massachusetts curves are roughly parallel, indicating that the percentage decrease in the infant mortality has been about the same in the two countries.

At the bottom of the graph is a line representing the mortality under 1 month of age in New Zealand. This rate is about the same today as it was 50 years ago. Similar data are not available in the earlier Massachusetts reports; but since 1916, when such data became available for the United States birth registration area, the decline has been much less than that in the total infant mortality rate. If deaths under 1 week are considered, the decline has been still less, and deaths under 1 day do not seem to have declined at all.

Another line for New Zealand in Figure 1 represents deaths due to causes associated with early infancy. These deaths nearly all occur under 1 month of age, but the two groups are not identical. The trend, however, is the same—there has been little or no change in the rate for these causes in the past 50 years.

The death rate for causes associated with early infancy is shown for Massachusetts from 1901 to 1926. Although there has been some

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[2] Data are from the following sources

Massachusetts—Annual State Reports on Vital Statistics

United States registration area—Annual Reports on Birth Statistics for the United States.

New Zealand—A New Zealand Study in Infant Mortality By E. P. Neale. Jour. Amer. Statistical Assn, Sept, 1925.

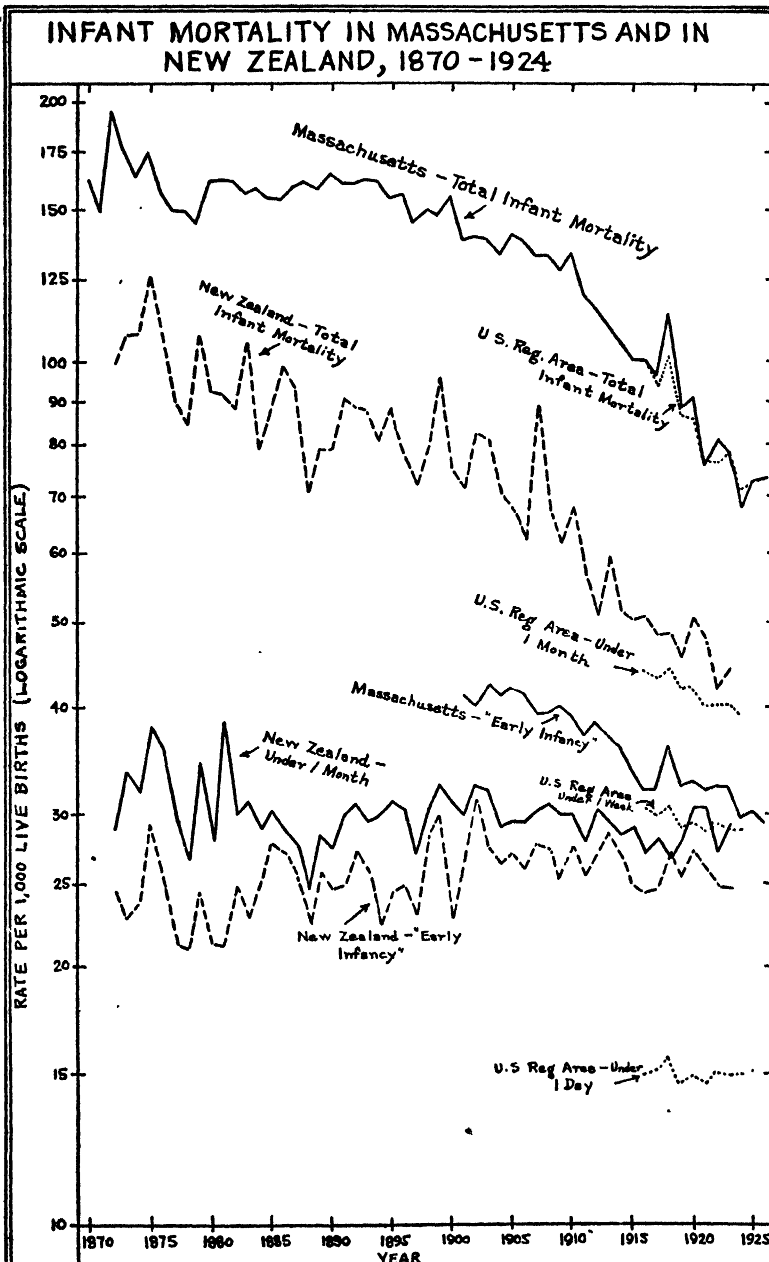
INFANT MORTALITY IN MASSACHUSETTS AND IN NEW ZEALAND, 1870-1924
RATE PER 1,000 LIVE BIRTHS (LOGARITHMIC SCALE)
YEAR
Massachusetts - Total Infant Mortality
New Zealand - Total Infant Mortality
U.S. Reg. Area - Total Infant Mortality
U.S. Reg Area - Under 1 Month
Massachusetts - "Early Infancy"
New Zealand - Under 1 Month
U.S Reg Area Under 1 Week
New Zealand - "Early Infancy"
U.S Reg Area - Under 1 Day
200
175
150
125
100
90
80
70
60
50
40
30
25
20
15
10
1870
1875
1880
1885
1890
1895
1900
1905
1910
1915
1920
1925

FIG. 1

decrease in deaths from these causes, the decline is much less than in the total infant mortality.

Pirquet [3] has shown that in England and Wales the death rate during the first month of life had decreased very little; all the decrease in infant mortality has been in the ages over 1 month of age. Dublin [4] has pointed out that while infant mortality after the first month of life has decreased a great deal in the past 20 years the mortality of the first month of life has remained nearly the same throughout that period.

Woodbury [5] has shown that in the birth registration area of the United States infant mortality from malformations increased 10 per cent and from injury at birth increased 23 per cent from 1915 to 1921, although during the same period infant mortality from all causes decreased 21 per cent, diarrhea and enteritis decreased 34 per cent, respiratory diseases decreased 32 per cent, and in general other diseases important in the later months of the first year of life decreased considerably.

It appears, then, that infant mortality, as a whole, has been decreasing, but the mortality of early infancy has long been at a standstill, apparently unaffected by measures that have been taken to reduce infant mortality.

INFANT MORTALITY IN DIFFERENT CITIES

In different cities of the United States the infant mortality rate varies considerably even when cities of approximately the same size are compared. The question arises as to which causes of death are chiefly responsible for the difference. Is the variation chiefly in the early deaths which are presumably tied up with prenantal conditions or is it in the later months of infancy when postnatal conditions presumably have more influence on mortality?

The nine cities for which the data are given are all within the class of 100,000 to 600,000 population and range from the lowest to the highest in this country in infant mortality rates. These nine cities were selected solely on the basis of the size of the total infant mortality rate.

The infant mortality rate for Pittsburgh applies to the white population only; in the other cities the rate is for the total population. Pittsburgh is the only one of these cities with any large number of negroes.

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[3] Pirquet, C. The Decrease of the Death Rate Except among the Newborn. Monthly Epidemiological Report of the Health Section of the League of Nations, Sept. 15, 1926, p 584.

[4] On Preventing Deaths in Early Infancy Statistical Bulletin, Metropolitan Life Insurance Co, Vol. III, No. 10 (Oct., 1922).

[5] Woodbury, R. M.: Decline in Infant Mortality in the United States Birth Registration Area, 1915-1921. Amer. Jour of Public Health, May, 1923.

TABLE 1.—*Populations, infant mortality rates, and birth rates in nine selected cities of the United States*

City	Population, census of 1920	Number of births, 1922–1924	Infant mortality rate per 1,000 live births, 1922–1924	Number of married women 15–54 years of age, 1920	Number of births, 1920	Birth rate per 1,000 married women 15–54 years of age, 1920	Birth rate per 1,000 total population, 1920
Seattle, Wash	315,312	16,032	48.5	62,978	6,166	97.9	19.6
Minneapolis, Minn	380,582	29,012	53.8	70,226	9,182	130.7	24.1
Portland, Oreg	258,288	15,435	54.2	51,667	5,202	100.7	20.1
San Francisco, Calif	506,676	26,366	56.6	90,958	9,034	99.3	17.8
Akron, Ohio	208,435	14,015	65.6	39,798	5,395	135.6	25.9
Rochester, N. Y	295,750	19,646	68.3	54,434	6,716	123.4	22.7
Pittsburgh, Pa	[1] 588,343	[2] 42,222	[2] 90.5	[2] 94,976	[2] 13,912	[2] 146.5	[2] 25.3
New Bedford, Mass	121,217	9,809	96.5	21,777	3,507	161.0	28.9
Fall River, Mass	120,485	10,772	103.8	19,403	3,537	182.3	29.4

[1] Includes 38,082 colored persons. Rates for Pittsburgh are for white only. For all the other cities the rate is for the total population, since none of the cities includes any large number of colored. Deaths for 1922 in these cities were not given by cause, age, and color.
[2] White only.

It is fully realized that these cities are not comparable. Pittsburgh is a "steel" town, with a population composed of many races; Fall River is a "textile" town; Minneapolis a flour-milling center of the agricultural Northwest. Again, these cities differ climatically. San Francisco is cooler in summer and probably warmer in winter than most of the other cities.

But no matter how different the conditions in these nine cities may be, it would seem legitimate to compare infant mortality at different ages and from different causes to see if the rates in these different subgroups run along with the total rates or whether the differences between the cities show up only in certain age periods and for certain causes of infant mortality. In Table 2 and Figure 2 a comparison of the rates in the nine cities is made for all ages and for the three age periods, under 1 week, 1 week to 1 month, and 1 month to 1 year.

TABLE 2.—*Infant mortality from all causes at different age periods of the first year of life in nine selected cities of the United States, 1922–1924*

City	All ages	Under 1 week	1 week to 1 month	1 month to 1 year
INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS				
Seattle, Wash	48.46	24.33	5.36	18.77
Minneapolis, Minn	53.81	26.95	8.03	18.82
Portland, Oreg	54.16	29.09	6.74	18.33
San Francisco, Calif	56.63	24.43	7.59	24.62
Akron, Ohio	65.57	26.83	8.78	29.97
Rochester, N. Y	68.26	30.34	9.06	28.86
Pittsburgh, Pa	90.50	30.77	11.82	47.91
New Bedford, Mass	96.54	30.48	11.72	54.34
Fall River, Mass	103.79	32.58	8.54	62.66

TABLE 2.—*Infant mortality from all causes at different age periods of the first year of life in nine selected cities of the United States, 1922–1924*—Continued

City	All ages	Under 1 week	1 week to 1 month	1 month to 1 year
RATIO OF THE RATE IN EACH CITY TO THE RATE FOR SEATTLE (SEATTLE RATE = 100)				
Seattle, Wash	100	100	100	100
Minneapolis, Minn	111	111	150	100
Portland, Oreg	112	120	126	98
San Francisco, Calif	117	100	142	131
Akron, Ohio	135	110	164	160
Rochester, N. Y	141	125	169	154
Pittsburgh, Pa	187	126	221	255
New Bedford, Mass	199	125	219	290
Fall River, Mass	214	134	159	334
NUMBER OF DEATHS				
Seattle, Wash	777	390	86	301
Minneapolis, Minn	1,561	782	233	546
Portland, Oreg	836	449	104	283
San Francisco, Calif	1,493	644	200	649
Akron, Ohio	919	376	123	420
Rochester, N. Y	1,341	596	178	567
Pittsburgh, Pa	3,821	1,299	499	2,023
New Bedford, Mass	947	290	115	533
Fall River, Mass	1,118	351	92	675

The rates in all cases are per 1,000 live births without any reduction to an annual basis. The annual death rate under 1 week would really be about fifty-two times the rates given here, or something like 1,500 per 1,000; in other words, if deaths continued at the rate they occur during the first week of life all the infants would die before they reached their first birthday. However, we are interested only in a comparison as between the cities, and as long as we compare rates for the same age period the different cities may be compared without reducing the rates to an annual basis.

In the top section of the graph the actual rates are shown; in the lower section they have been put on an index basis by dividing the rate for each city by the rate for Seattle, the city of this group having the lowest total infant mortality rate during the three years 1922–1924. In the age group under 1 week there is relatively little difference in the rates in the nine cities, the highest rate being only 34 per cent greater than the rate for Seattle. The age group 1 week to 1 month varies somewhat more; and when we turn to the age group from 1 month to 1 year of age there is a great deal more variation. In this latter age group the rate for Fall River is 234 per cent higher than the rate for Seattle, the rate for Pittsburgh is 155 per cent higher, and the rate for New Bedford is 190 per cent higher than the Seattle rate. Nearly all of the large differences in the infant mortality rates of these cities are in the rates over 1 month of age; the rates under 1 week are relatively constant. The geographical position, climatic conditions, racial stock, industrial conditions, and many other

important factors are widely different for these nine cities, and yet the infant mortality under 1 month of age remains relatively constant.

No doubt the activities for the conservation of infant lives by health agencies in these various cities are widely different, yet the

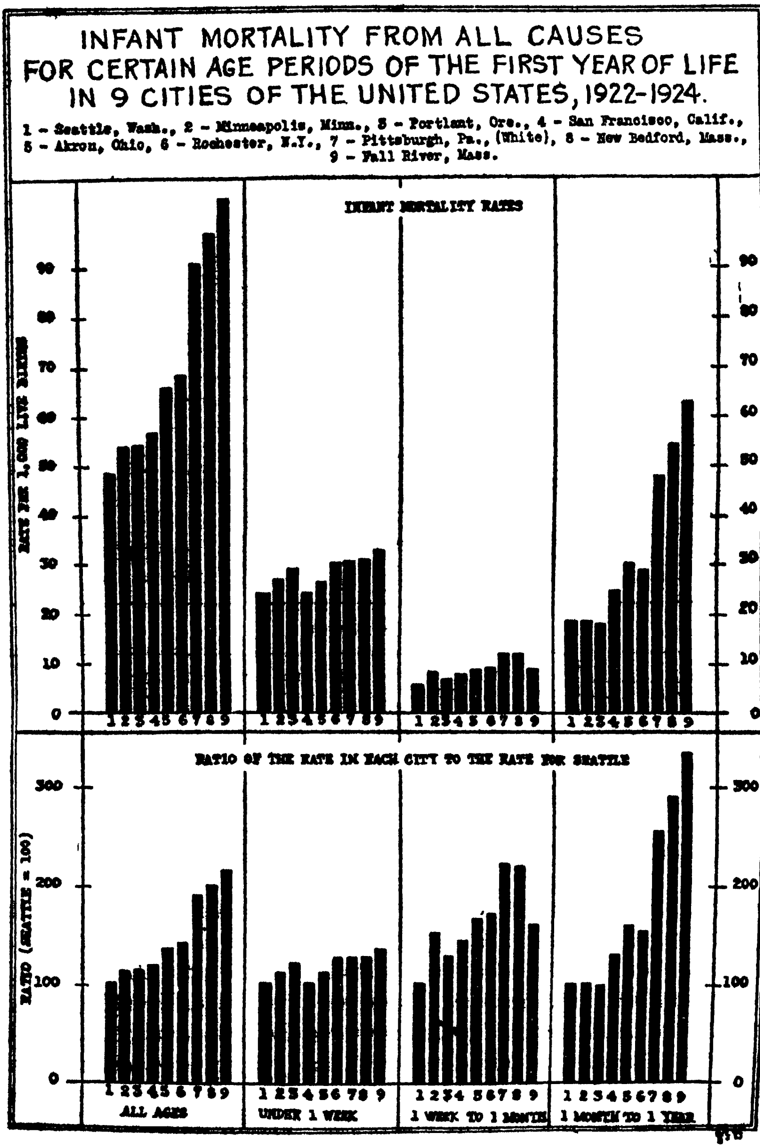

FIG. 2

death rates under 1 week of age are not at great variance. Evidently such measures as are at present taken to save infant lives have had little effect on deaths under 1 week of age.

TABLE 3.—*Infant mortality from certain causes at all ages under 1 year in nine selected cities of the United States, 1922–1924*

[Numbers following causes refer to International List of the Causes of Sickness and Death, 1920]

City	Infectious diseases of children [1] (7–10)	Other infectious diseases [2] (16, 21, 24, 29)	Tuberculosis (all forms) (31–37)	Pneumonia (all forms) and bronchitis (99–101)	Influenza (11)	Syphilis (38)	Diarrhea and enteritis (113)	Congenital malformations (159)	Congenital debility (160)	Premature birth (161A)	Injury at birth (161B)	Other diseases of early infancy (162–163)
INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS												
Seattle, Wash	1.31	0 50	0.81	5.30	1.93	1.00	2.56	6.24	1.68	15.78	3.93	1.81
Minneapolis, Minn	1.79	1.07	.69	7.55	.52	.76	2.55	5.89	1.55	17.82	4.76	2.10
Portland, Oreg	1.62	.65	.39	6.03	.97	.52	2.53	6.22	2.07	16.62	6.22	2.85
San Francisco, Calif	1.86	.64	1.33	10.20	.64	1.21	4.74	5.54	.76	16.27	4.67	2.81
Akron, Ohio	2 64	.57	.64	10.35	1.21	.50	6.21	5.78	2.21	20.83	3.92	1.78
Rochester, N. Y	2.80	.56	.56	9.06	41	.81	11.91	7.28	.81	19.14	7.69	2.55
Pittsburgh, Pa	4 05	.83	1.11	16.98	1.37	1.78	17.22	9.14	2.34	19.80	5.92	2.77
New Bedford, Mass	4.49	.41	1.33	21.82	.61	1.12	18.04	7.75	2.65	16.82	6.42	6.22
Fall River, Mass	6 41	.84	1.11	18.57	1.02	.56	27.48	7.43	2.51	18.38	8.35	2.04
RATIO OF THE RATE IN EACH CITY TO THE RATE FOR SEATTLE (SEATTLE RATE=100)												
Seattle, Wash	100	100	100	100	100	100	100	100	100	100	100	100
Minneapolis, Minn	137	214	85	142	27	76	100	94	92	113	121	116
Portland, Oreg	124	130	48	114	50	52	99	100	123	112	158	157
San Francisco, Calif	142	128	164	192	33	121	185	89	45	103	119	155
Akron, Ohio	202	114	79	195	63	50	243	93	132	132	100	98
Rochester, N. Y	214	112	69	171	21	81	465	117	48	121	196	141
Pittsburgh, Pa	309	166	137	320	71	178	673	146	139	125	151	153
New Bedford, Mass	343	82	164	412	32	112	705	124	158	107	163	344
Fall River, Mass	489	168	137	350	53	56	1,073	119	149	116	212	113
NUMBER OF DEATHS												
Seattle, Wash	21	8	13	85	31	16	41	100	27	253	03	29
Minneapolis, Minn	52	31	20	219	15	22	74	171	45	517	138	61
Portland, Oreg	25	10	6	93	15	8	39	96	32	272	96	44
San Francisco, Calif	49	17	35	269	17	32	125	146	20	429	123	74
Akron, Ohio	37	8	9	145	17	7	87	81	31	292	55	25
Rochester, N. Y	55	11	11	178	8	16	234	143	16	376	151	50
Pittsburgh, Pa	171	35	47	717	58	75	727	386	99	836	250	117
New Bedford, Mass	44	4	13	214	6	11	177	76	26	165	03	61
Fall River, Mass	09	9	12	200	11	6	296	80	27	198	90	22

[1] Including measles, scarlet fever, whooping cough, and diphtheria.
[2] Including dysentery, erysipelas, meningococcus meningitis, and tetanus.

Table 3 and Figure 3 show infant death rates in the nine cities from different causes. The upper section shows actual rates and the middle section shows indices computed by dividing the rate for each city by the rate for Seattle. Diarrhea and enteritis stand out as the cause of death, which varies most in the different cities, but the infectious diseases of children and the respiratory diseases also show considerable variation from city to city. The group of causes at the right of the graph, congenital malformations, congenital debility, premature birth, injury at birth, and other diseases of early infancy, show relatively little variation in the different cities.

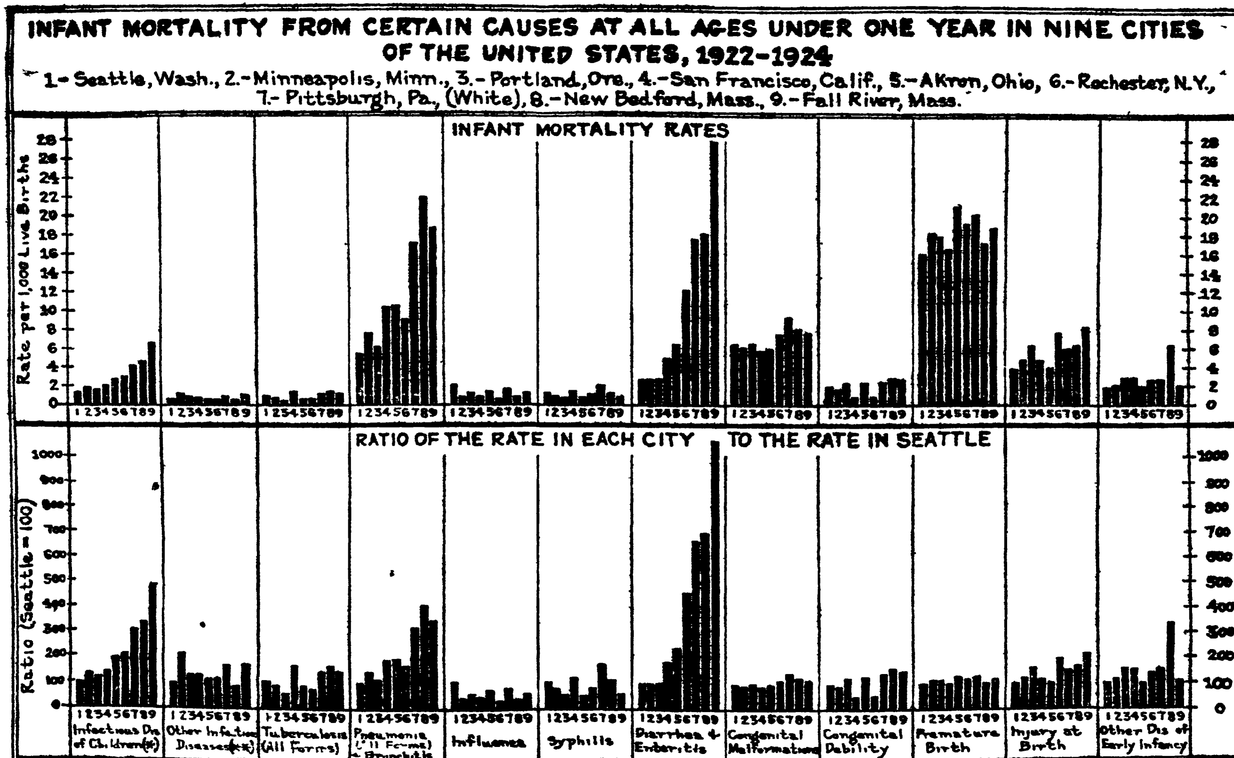

FIG 3

* Includes measles, scarlet fever, whooping cough, and diphtheria. ** Includes dysentery, erysipelas, meningococcus meningitis, and tetanus.

Deaths from the causes which vary least in the different cities occur largely during the first month of life. Figures 2 and 3 reflect the same conditions.

The great problem of neonatal infant mortality remains before us and its fundamental causes appear to be the same throughout the civilized world.

APPENDIX

TABLE 4.—*Infant mortality from certain causes for certain age periods of the first year of life in nine selected cities of the United States, 1922–1924*

[Numbers following causes refer to International List of the Causes of Sickness and Death, 1920]

Age period and city	All causes	Infectious diseases of children [1] (7–10)	Other infectious diseases [2] (16, 21, 24, 28)	Tuberculosis (all forms) (31–37)	Pneumonia (all forms) and bronchitis (99–101)	Influenza (11)	Syphilis (38)	Diarrhea and enteritis (113)	Congenital malformations (159)	Congenital debility (160)	Premature birth (161A)	Injury at birth (161B)	Other diseases of early infancy (162–163)
INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS													
Under 1 week													
Seattle, Wash	24.33	------	------	------	0.31	0.06	0.31	0.06	3.31	0.69	13.66	3.56	1.50
Minneapolis, Minn	26.95	0.03	0.03	0.03	.31	.03	.21	.10	3.03	.55	15.10	4.31	1.76
Portland, Oreg	29.09	------	------	------	.32	.06	.32	------	3.05	1.36	14.77	5.70	2.27
San Francisco, Calif	24.43	------	------	------	.38	.04	.42	------	2.77	.19	13.65	4.17	2.20
Akron, Ohio	26.83	------	------	------	.21	------	.14	.14	2.71	.78	16.27	3.64	1.28
Rochester, N.Y	30.34	------	------	------	.25	------	.10	.25	4.22	.20	15.68	6.92	1.78
Pittsburgh, Pa	30.77	------	.02	------	.36	------	.17	.26	4.76	.43	15.58	5.52	2.34
New Bedford, Mass	30.48	------	------	------	.10	------	------	.10	4.49	.71	12.85	5.81	4.89
Fall River, Mass	32.58	------	------	------	------	------	------	------	4.36	1.39	15.41	7.71	1.76
1 week to 1 month													
Seattle, Wash	5.36	------	.19	------	.62	.31	.06	.44	.81	.19	1.68	.31	.25
Minneapolis, Minn	8 03	.07	.38	.03	1.14	------	.14	.59	1.17	.38	2.14	.31	.28
Portland, Oreg	6.74	.13	.19	------	.78	.13	.06	.26	.78	.26	2.07	.52	.58
San Francisco, Calif	7.59	.08	.11	.08	1.29	.04	.08	.61	.95	.30	2.12	.38	.49
Akron, Ohio	8.78	.07	------	.07	1.43	.21	------	.50	1.07	.36	3.21	.29	.50
Rochester, N.Y	9.06	.10	.10	------	1.02	------	.31	1.07	1.17	.46	2.70	.76	.66
Pittsburgh, Pa	11.82	.09	.09	.05	1.73	.07	.17	1.85	1.94	.71	3 39	.36	.31
New Bedford, Mass	11.72	------	.20	------	1.22	.10	.51	1.84	1.33	.71	3.16	.61	1.02
Fall River, Mass	8.54	------	------	------	.93	------	------	1.95	.93	.46	2.23	.46	.28
1 month to 1 year													
Seattle, Wash	18.77	1.31	.31	.81	4.37	1.56	.62	2.06	2.12	.81	.44	.06	.06
Minneapolis, Minn	18.82	1.69	.65	.62	6.10	.48	.41	1.86	1.69	.62	.59	.14	.07
Portland, Oreg	18.33	1.49	.45	.39	4.92	.78	.13	2.27	2.40	.45	.78	------	------
San Francisco, Calif	24.62	1.78	.53	1.25	8.53	.57	.72	4.13	1.82	.27	.49	.11	.11
Akron, Ohio	29.97	2.57	.57	.57	8.70	1.00	.36	5.57	2.00	1.07	1.36	------	------
Rochester, N. Y	28.86	2.70	.46	.56	7.79	.41	.41	10.59	1.88	.15	.76	------	.10
Pittsburgh, Pa	47.91	3.96	.71	1.07	14.90	1.30	1.44	15.11	2.44	1.21	.83	.05	.12
New Bedford, Mass	54.34	4.49	20	1.33	20.49	.51	.61	16.11	1.94	1.22	.82	------	.31
Fall River, Mass	62.66	6.41	.84	1.11	17.64	1.02	.56	25.53	2.14	.65	.74	.19	------
NUMBER OF DEATHS													
Under 1 week													
Seattle, Wash	390	------	------	------	5	1	5	1	53	11	219	57	24
Minneapolis, Minn	782	1	1	1	9	1	6	3	88	16	438	125	51
Portland, Oreg	449	------	------	------	5	1	5	------	47	21	228	88	85
San Francisco, Calif	644	------	------	------	10	1	11	------	73	5	360	110	58
Akron, Ohio	376	------	------	------	3	------	2	2	38	11	228	51	18
Rochester, N.Y	596	------	------	------	5	------	2	5	83	4	308	136	85
Pittsburgh, Pa	1,299	------	1	------	15	------	7	11	201	18	658	233	99
New Bedford, Mass	299	------	------	------	1	------	------	1	44	7	126	57	48
Fall River, Mass	351	------	------	------	------	------	------	------	47	15	166	83	19

[1] Including measles, scarlet fever, whooping cough, and diphtheria.
[2] Including dysentery, erysipelas, meningococcus meningitis, and tetanus.

TABLE 4.—*Infant mortality from certain causes for certain age periods of the first year of life in nine selected cities of the United States, 1922–1924*—Continued

[Numbers following causes refer to International List of the Causes of Sickness and Death, 1922-1924]

Age period and city	All causes	Infectious diseases of children (7-10)	Other infectious diseases (16, 21, 24, 29)	Tuberculosis (all forms) (31-37)	Pneumonia (all forms) and bronchitis (99-101)	Influenza (11)	Syphilis (38)	Diarrhea and enteritis (113)	Congenital malformations (159)	Congenital debility (160)	Premature birth (161A)	Injury at birth (161B)	Other diseases of early infancy (162-163)
	NUMBER OF DEATHS—continued												
1 week to 1 month													
Seattle, Wash	86	------	3	------	10	5	1	7	13	3	27	5	4
Minneapolis, Minn	233	2	11	1	33	------	4	17	34	11	62	9	8
Portland, Oreg	104	2	3	------	12	2	1	4	12	4	32	8	9
San Francisco, Calif	200	2	3	2	34	1	2	16	25	8	56	10	13
Akron, Ohio	128	1	------	1	20	3	------	7	15	5	45	4	7
Rochester, N. Y	178	2	2	------	20	------	6	21	23	9	53	15	13
Pittsburgh, Pa	409	4	4	2	73	3	7	78	82	30	143	15	13
New Bedford, Mass	115	------	2	------	12	1	5	18	18	7	31	6	10
Fall River, Mass	92	------	------	------	10	------	------	21	10	5	24	5	3
1 month to 1 year													
Seattle, Wash	301	21	5	13	70	25	10	33	34	13	7	1	1
Minneapolis, Minn	546	49	19	18	177	14	12	54	49	18	17	4	2
Portland, Oreg	283	23	7	6	76	12	2	35	37	7	12	------	------
San Francisco, Calif	649	47	14	33	225	15	19	109	48	7	13	3	3
Akron, Ohio	420	36	8	8	122	14	5	78	28	15	19	------	------
Rochester, N. Y	567	53	9	11	153	8	8	208	37	3	15	------	2
Pittsburgh, Pa	2,023	167	30	45	629	55	61	638	103	51	35	2	5
New Bedford, Mass	533	44	2	13	201	5	6	158	19	12	8	------	3
Fall River, Mass	675	69	9	12	190	11	6	275	23	7	8	2	------

COURT DECISIONS RELATING TO PUBLIC HEALTH

City held not liable for use of land as garbage dumping ground by city scavenger.—(Mississippi Supreme Court, Division B; City of Laurel *v.* Ingram, 114 So. 881; decided December 12, 1927.) An action for damages was brought against the city of Laurel on account of the use of plaintiff's land as a dumping ground for the garbage of the city. The city employed a scavenger to remove and dispose of garbage and other refuse matter, including dead animals, from residences and business places, as well as the city garbage and refuse proper. Fees for the scavenger's services were fixed by the city, and were paid by the property owners to the scavenger. The charges for the removal of the city garbage proper were paid by the city itself. The scavenger was to provide his own dumping ground, and the city retained no control over him as to how or where he should dispose of the garbage. The plaintiff recovered in the lower court and the city appealed. The supreme court took the view that the city was not liable, basing its decision on the ground that the scavenger was an independent contractor. The court said:

If the city scavenger, in the present case, was an independent contractor, it is wholly immaterial whether appellant, in providing for the disposition of garbage and dead animals, was acting in its governmental, or in its private corporate

capacity. In either case, there would be no liability on the part of appellant for the damage done appellee's land by the scavenger in the performance of his work. The selection of the dumping ground would not be the act of appellant, but the act of the scavenger, the independent contractor, for which the latter alone would be liable to any person thereby injured.

We see no escape under the undisputed facts of this case from holding that the city scavenger was as much an independent contractor as the sanitary contractor was in the Shepperd Case. Knowledge on the part of the city authorities that the city scavenger was trespassing on appellee's property did not make the appellant liable; nor did the fact that, when appellee made complaint to the mayor of what was being done, the latter undertook to stop the practice. The mayor could not bind appellant in that manner. He had no right to direct the scavenger where to dump the garbage and dead animals.

Collection of ashes and rubbish held to be a governmental function.—(Ohio Court of Appeals, Cuyahoga County; Gorman *v.* City of Cleveland et al., 159 N. E. 136; decided May 2, 1927.) The plaintiff brought an action against a street railway company and the city of Cleveland to recover damages for injuries received while he was a passenger on a street car. It appeared that, while the plaintiff was attempting to alight from a street car, the car was struck in the rear by a city truck used to collect ashes and rubbish from residences and business places within the city, and that the plaintiff was injured when the sliding door on the street car closed upon his foot. The trial court rendered judgment in favor of the city on the ground that the collection of ashes and rubbish was a governmental, and not a proprietary, function. The court of appeals affirmed the judgment of the lower court.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Summer Camps in Pennsylvania. H. M. Freeburn, *Public Health News*, New Jersey State Department of Health, vol. 12, No. 5, April, 1927, pp. 118–120. (Abstract by E. C. Sullivan.)

This article, which is a part of a paper read before a meeting of the New Jersey Sanitary Association on December 3, 1926, summarizes some of the work done by the Pennsylvania Department of Health in the supervision of summer camps. The work of inspecting such camps has rapidly increased; and since many of the camps are occupied by children, every effort is made by the bureau of engineering of the State Health Department to have such camps placed in a sanitary and healthful condition.

With the increased use of automobiles, dangerous water supplies and insanitary conditions along roads have become a greater menace than heretofore with respect to the possibilities of typhoid fever being contracted at road side stands and camps and being carried back to the cities. The problem has been handled in Pennsylvania by the establishment of a fully equipped bacteriological laboratory on a motor truck, detailed surveys of such supplies along highways, and the placarding with signs stating whether or not the water supplies are safe. Tourist camps have been included within the scope of this work.

The article gives the rules and regulations of the Commonwealth of Pennsylvania governing the establishment of camps, defining the word, and outlining the necessary requirements for their establishment and maintenance.

Estimation of Lighting in Schools. Anon. *The Medical Officer*, No. 986 (vol. 37, No. 25), June 18, 1927, p. 285. (Abstract by C. L. Pool.)

Lighting Birmingham schools was studied by comparing the illumination received on a screen in a given position with the illumination received from the whole hemisphere of the sky. The ratio was obtained by referring each reading to the illumination from a standard lamp. A coefficient of 0.01 indicates that the light received at a given point is equal to one-hundredth part of the light available from the total sky.

Readings were made near the middle and at the worst lighted parts of the room. Average readings varied from coefficients 0.0014 to 0.02 and "worst" readings from 0.00043 to 0.077. Standards were suggested for "good," "fair," "poor," and "bad lighting"—i. e., good lighting being indicated by coefficients of 0.02 (or above) to 0.007 in the middle of the room, and coefficients of 0.007 (or above) to 0.003 at the worst lighted points.

Poisoning by Carbon Monoxide Gas from Heaters, Motors, Etc. C. E. B. Waldron. *Health Bulletin*, State of Victoria, Australia, No. 10, April–June, 1927, pp. 311–319. (Abstract by Leonard Greenburg.)

The author of this paper describes the various means by which carbon monoxide is formed, and reiterates the fact that the ordinary gas heater may be a producer of carbon monoxide under certain conditions. Due to its extremely poisonous character, and the fact that it is colorless and odorless, carbon monoxide is a very subtle poison. Every bathroom in which a gas heater is installed, the author says, should be equipped with ample, permanent inlet and outlet ventilation, the inlet ventilation by an external wall vent situated just above the floor level, and the outlet vent about 1 foot below the ceiling. The flue of the gas heater should be carried through the roof space to the open air and cowled so as to prevent down drafts. Care should be exercised in locating the ventilating pipe to insure an up current, and for at least 4 feet the pipe should be vertical. In the absence of these precautions the room door and window should be left open.

The insidious onset of the effects of carbon monoxide are described and the symptoms presented in some detail. First-aid measures include the removal of the gassed victim and the use of emetics if the person is conscious. The administration of artificial respiration and the use of stimulants are described.

Report on the Working of the Corporation of Madras Water Analysis Laboratory for 1926. S. V. Ganapati. 62 pages. (Abstract by R. E. Thompson.)

Extensive tabulated analytical data are given. Consumption during the year was 15–19 m. g. per day, of which 12.73 m. g. was treated by slow sand filtration, the deficiency being made up with raw water from Red Hills Lake, the source of supply, which was chlorinated during the period July to December. There are 17 filters, 14 of 1 m. g. d. capacity and 3 of 1.33 m. g. d. capacity. Average length of filter run was 18 days, efficient length of run as regards rate of filtration being 10 days. Production of hydrogen sulphide in all beds continued to be a disconcerting feature, persisting even when chlorinated water was applied to filters. The water as supplied differed very little from raw water, the quality being considerably below all accepted standards. Hankinisation of city supply for short period when bleach supply failed gave rise to many complaints of objectionable colored growths due to manganese bacteria. Vibrios appeared in water in July and chlorination was immediately adopted. Chlorination of filtered water was rendered ineffective by the hydrogen sulphide present, and point of application was shifted to the raw water. Notwithstanding this treatment the vibrios persisted in the water supplied to the city. It was found that the vibrios were not true *V. cholerae*. Experiments on double filtration employing bed of

coke for primary filtering medium followed by sand filtration at double the normal rate were unsuccessful.

Developing and Protecting Underground Water Supplies. J. G. Montgomery. Proceedings Ninth Texas Water Works Short School, January, 1927. pp. 125–129. (Abstract by W. M. Olson.)

Discusses protection of underground water supplies with particular reference to Texas conditions. Includes instructions developed by Layne-Texas Company to prevent pollution of new wells during construction and to provide initial disinfection upon completion. "After well has been completed and developed, six 2-ounce capsules of chloride of lime for each 100 gallons of water within the pipe should be sent to the bottom of the well. Well should not be pumped again for 48 hours."

Discussion of paper by Julian Montgomery presents data concerning supplies from the "sheet water" of West Texas. A quotation from Prof. E. W. Steel states conservative methods of protecting wells.

Detention Periods Required for Coagulation of Lake Erie Water at Cleveland. W. C. Lawrence. Sixth Annual Report of Ohio Conference on Water Purification, 1926. pp. 51–55. (Abstract by R. E. Thompson.)

Data obtained in study of retention periods required for coagulation at Cleveland plants are presented. Definite conclusions can not yet be formed as to most satisfactory detention period. While work wa carried out solely for purpose of determining proper detention periods required to obtain good filter influent, it has resulted in saving in chemicals used to the extent of $5,500 in nine months.

Report of the Special Master to the Supreme Court of the United States in the cause entitled State of Wisconsin et al. v. State of Illinois and Sanitary District of Chicago, State of Missouri. et al. 197 pages. (Abstract by Arthur P. Miller.)

In the cause entitled State of Wisconsin et al. *v.* State of Illinois and Sanitary District of Chicago, State of Missouri, et al., intervening defendants, being No. 7, Original October term, 1927, the United States Supreme Court appointed as special master Charles E. Hughes. All the parties, complainants and defendants, presented their evidence and were heard in argument in Washington between November 8, 1926, and June 3, 1927.

In the special master's report the following are given as the questions of law:

"(1) Whether the complainants present a justiciable controversy and have the requisite interest to entitle them to invoke the jurisdiction of the court; and if so,

"(2) Whether the State of Illinois had the right, as against the complainants, to divert the waters of Lake Michigan in the manner and for the purposes shown, without the consent of the United States; and, if not,

"(3) Whether Congress has the authority to control the diversion; that is, in its regulation to determine whether and to what extent the diversion should be permitted; and if so,

"(4) Whether Congress has given the permission; and, if it has not directly,

"(5) Whether the Secretary of War had authority under the act of March 3, 1899, to regulate the diversion; and if so,

"(6) Whether the permit of March 3, 1925, and its conditions, are valid; and, finally,

"(7) As to the provisions of the decree which should be entered, in the light of the determination of these questions."

Mr. Hughes's conclusions on these questions of law were as follows:

"(1) That the complainants present a justiciable controversy.

"(2) That the State of Illinois and the Sanitary District of Chicago have no authority to make or continue the diversion in question without the consent of the United States.

"(3) That Congress has power to regulate the diversion; that is, to determine whether and to what extent it should be permitted.

"(4) That Congress has not directly authorized the diversion in question.

"(5) That Congress has conferred authority upon the Secretary of War to regulate the diversion, provided he acts in reasonable relation to the purpose of his delegated authority and not arbitrarily.

"(6) That the permit of March 3, 1925, is valid and effective according to its terms, the entire control of the diversion remaining with Congress."

The master's recommendations for decree are as follows:

"In the light of these conclusions, the bill, in my opinion, should be dismissed. I think, however, that if a situation should develop in which the defendants were seeking to create or continue a withdrawal of water from Lake Michigan without the sanction of Congress or of administrative officers acting under its authority, the complainant States have such an interest as would entitle them to bring a bill to restrain such action.

"I therefore recommend that the bill be dismissed without prejudice to the right of the complainants to institute suit to prevent a diversion of water from Lake Michigan in case such diversion is made or attempted without authority of law."

The Determination of Available Chlorine in Water-sterilizing Powder (Chlorine) by Means of the Horrocks Box and Hypo Tablets. S. Elliott. *Journal of the Royal Army Medical Corps*, vol. 49, No. 2, August 1927, pp. 116–118. (Abstract by S. H. Smith.)

A method, not as accurate as laboratory methods, but sufficiently so for rough work in the field, for determining the amount of available chlorine in water-sterlizing powders, is described. The method contemplates the use of the Horrocks box, but gives capacities of cups and scoops included in such box, and gives the strength of the few solutions used. The method is simple, and it should take only a few minutes to make such a test.

The Value of Methods for the Differentiation of Bacilli of the Coli-aerogenes Group, when Applied in Shanghai. E. P. Hicks. *Journal of Hygiene*, vol. 26, No. 3, August, 1927 pp. 357–361. (Abstract by C. T. Butterfield.)

The collection made of the coli-aerogenes group included the following strains: 100 from human, 50 from animals, and 50 from soil. The tests applied were: Methyl red, Voges-Proskauer, Koser's citrate, and indol production. Before each test the respective media were incubated for five days at 37° C.

Very little difference was noted between the fecal strains from human and animal sources. With the citrate test, 92.7 per cent of the human-animal strains failed to grow, while only 20 per cent of the soil strains failed. Indol was produced by 91.3 per cent of the strains from fecal sources and by 32 per cent of those from the soil. With the methyl red and Voges-Proskauer tests, 95.3 per cent of the fecal strains and 76 per cent of the soil strains were M. R. + and V. P. –. From this the author concludes in part that the citrate and indol tests are of value, the citrate being the better of the two, and that the methyl red and Voges-Proskauer tests are of no value.

Inasmuch as the soil samples were collected chiefly from railway embankments, rifle ranges, and the tops of grave mounds, it is possible that some fecal strains may have been present in the soil.

Discussion of Raw Water Chlorination Experiments at Sandusky. L. H. Enslow, Sixth Annual Report of the Ohio Conference on Water Purification, 1926, pp. 57–59. (Abstract by R. E. Tarbett.)

Chlorine, when first applied to water or sewage, combines with the organic substances having an avidity therefor; oxidation is not obtained until this demand is satisfied and free chlorine is present to a considerable extent.

Reduction of hydrogen ion concentration and phenol distinction require that a considerable excess of free chlorine be maintained. Increased coagulation efficiency due to prechlorination is probably caused by a change brought about in the colloidal substances.

In a number of Texas plants, algal growths in reservoirs have been controlled by chlorination of the entering water. In one plant the addition of a small amount of lime following the application of chlorine was found more efficacious than chlorine alone. Bacterial aftergrowths following chlorination would appear to have little significance from standpoint of nuisance or pathogenic quality.

Superchlorination followed by dechlorination with liquid sulphur dioxide for elimination of tastes and odors from chlor-substitution products has been successful at Toronto. Contact of one hour is allowed, the residual chlorine being 0.3 to 0.6 p. p. m. at time of dechlorination. This residual is reduced to 0.1 p. p. m. Sulphur dioxide is added in same manner as liquid chlorine.

Supervision of Public Water Supplies in Connecticut. Warren J. Scott, *Connecticut Health Bulletin*, vol. 41, No. 11, November, 1927, pp. 235–239. (Abstract by H. V. Pedersen.)

This article is a brief summary of the effort the State department of health is constantly making to safeguard and improve the public water supplies of the State Some of the activities discussed are listed as follows: (1) Inspection of watersheds; (2) chlorination plant inspection; (3) filter plant inspection; (4) investigation of complaints; (5) surveys of adequacies of supplies; (6) supervision of cross connections; (7) approval of new supplies; (8) periodic testing of all public water supplies.

The author quotes from the Connecticut statutes the power invested in the health department to protect public water supplies and discusses briefly, in an interesting and instructive way, the activities of the bureau of sanitary engineering.

Sanitary Scoring of Water Supplies. Anon. *Public Works*, vol. 58, No. 10, October, 1927, pp. 386–388. (Abstract by R. J. Faust.)

The object of the score system is to list the many sanitary dangers, the several protective measures, and the desirable qualities of the water delivered. The assignment of numerical penalties and credits is for the purpose of indicating relative values in an approximately quantitative way. The committee of the New England Water Works Association, which presented the scoring system as outlined in the article, does not pretend that the values given are the best that can be selected, nor that they are exact, but it does believe that the values are relatively reasonable. An outline of the score system is included in the article.

Aeration of Water and Sewage. Anon. *Public Works*, vol. 58, No. 10, October 1927, pp. 366–367. (Abstract by R. J. Faust.)

To prove that considerable aeration takes place from the surface of the air bubbles as they ascend through a column of water, special experimental apparatus was devised. This apparatus eliminates the criticism that a bulk of the aeration comes by "streaming" from the upper surface when the bubbles break. A picture of the apparatus and an explanation of the experiment are given. The results are in tabular form and show conclusively that aeration takes place from the surface of air bubbles as they ascend through water.

Note on the Aeration of Water. Gilbert J. Fowler and S. N. Chatterjee. *The Surveyor*, vol. 72, No. 1855, August 12, 1927, p. 139. (Abstract by D. C. Ruchhoft.)

An apparatus, consisting principally of 3 aspirator bottles and an aeration chamber made of the outer jacket of a Liebig condenser, arranged to determine the amount of oxygen that is dissolved from surface streaming and from air bubbles passing through the liquid in the condenser is described. When water containing about 1.0 p. p. m. of dissolved oxygen was allowed to stand in the condenser with only a small tube open to the air the oxygen content was increased to 1.2 p. p. m. in 24 hours. When the condenser was not quite full, leaving an area of water equal to the cross section of the condenser exposed, the solution of oxygen from the streaming effect was increased to 5.0 p. p. m. after standing an additional 24 hours. However, if air was slowly bubbled through the water in the condenser for only ten minutes, the oxygen content was increased from 1.0 to 5.0 p. p. m. The authors present this experiment to controvert the opinion that probably only a very minute quantity of oxygen is absorbed by sewage as air passes through it and that most of the aeration takes place at the surface.

Historical Review of Development of Control of Disease-Bearing Mosquitoes. J. A. LePrince. Proceedings of the American Society of Civil Engineers, Part I, September, 1927, pp. 1637–1640. (Abstract by L. L. Williams.)

This is a brief outline of the history of yellow fever and malaria. Yellow fever was last seen in this country in 1905. Savannah, Georgia, was the first city to make a serious attempt at malaria reduction, when they passed a law forbidding the maintenance of wet-culture (as rice culture was then called) near the city, and reimbursed the landowners for loss of potential crops. It details the wide extent of malaria up to the eightys, and shows a gradual decrease of malaria through extension of intensive farm drainage and improved living conditions, reduction of the cost and more general use of quinine, and the provision of metallic screens for the protection of homes. The first mosquito campaign was begun by Americans in Habana in 1901, against both yellow fever and malaria. The first antimosquito campaign in the United States was in connection with control of yellow fever in New Orleans, in 1905. Campaigns against malaria and the control of the disease due to mosquitoes in the United States were started in 1913, when surveys were first made in Virginia-North Carolina by Dr. H. R. Carter, of the United States Public Health Service. The first Federal appropriation of $16,000 was made in 1914 to the Public Health Service for investigations in malaria. Additional money has been furnished, and these investigations have continued to the present time.

The author estimates that extra-cantonment malaria work prevented the loss of approximately 5,000 men by death from malaria. After the World War the United States Public Health Service cooperated with the International Health Board and the State health departments in Southern States and started malaria-control activities in fourteen States. This control work still continues. Prior to 1914, less than six communities had undertaken malaria-control measures and the results were unsatisfactory. Since 1914, malaria-control measures have been satisfactory in 343 communities and 216 counties in 17 States; and surveys, control measures, and investigations have been carried on in 667 communities in 376 counties in 24 States.

It has been the author's good fortune to take an active part in all of the campaigns, commencing at Habana, Cuba, in 1901; with Gorgas and Carter in the Canal Zone; and then back to active work in the United States. "Every indication points to a reduction in malaria throughout the United States at a rate equal to, or possibly even more rapid rate than, that which has been attained in

the past twenty-five years. Should this prove true, it needs no prophet to foretell the outcome."

Paris Green as a Larvicide. Carlos Del Negro. *Archivos De Hygiene,* Department of Health, Brazil, vol. 1, No. 2, September, 1927, pp. 143–158.

"First. In a series of experiments carried out in Campos (State of Rio, Brazil), Paris green as a larvicide was found successful over any kind of vegetation. After the third, fourth, fifth, and sixth experiments, anopheline larvae were found living only at the percentages of 3, 4, 0.8, and 3, respectively. The used batch of Paris green contained only 40 per cent of arsenious acid.

"Second. The larvicide is employed in a mixture of 1 liter to 100 liters of dirt to 10,000 square meters of marsh. It was very difficult to maintain this rate.

"Third. The larvicide had no action on the pupae.

"Fourth. It was not harmful to the other swamp inhabitants, including the culicine larvae."

DEATHS DURING WEEK ENDED FEBRUARY 4, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended February 4, 1928, and corresponding week of 1927. (From the Weekly Health Index, February 8, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Feb. 4, 1928	Corresponding week 1927
Policies in force	70, 192, 320	66, 658, 783
Number of death claims	13, 911	13, 939
Death claims per 1,000 policies in force, annual rate	10. 4	10. 9

Deaths from all causes in certain large cities of the United States during the week ended February 4, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 8, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Feb. 4, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 4, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb 4, 1928	Corresponding week 1927	
Total (67 cities)	7, 532	13. 6	14. 0	708	835	[3] 61
Albany [4]	31	13. 5	16. 1	3	4	61
Atlanta	83	17. 1	16. 8	7	10	
White	46		13. 1	6	3	
Colored	37	(5)	25. 4	1	7	
Baltimore [4]	235	14. 8	15 7	17	24	54
White	184		13. 9	15	16	60
Colored	51	(5)	26. 4	2	8	31
Birmingham	73	17. 2	16. 8	7	10	60
White	31		12. 6	3	1	41
Colored	42	(5)	23. 4	4	9	90
Boston	217	14. 2	15. 5	24	26	66
Bridgeport	28			4	1	73
Buffalo	146	13 7	15. 0	13	13	56
Cambridge	37	15. 4	14. 3	4	7	71
Camden	37	14. 8	13. 7	3	6	48
Canton	24	10. 7	6 9	1	3	24
Chicago [4]	863	14. 3	13. 6	76	104	60
Cincinnati	126	15. 9	18. 0	13	18	79
Cleveland	179	9. 3	10. 2	21	16	57
Columbus	87	15. 3	14. 5	6	12	56
Dallas	46	11. 1	13. 3	2	7	
White	37		10. 8	1	4	
Colored	9	(5)	30. 4	1	3	
Dayton	40	11. 3	15. 6	2	4	33

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended February 4, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 8, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Feb. 4, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 4, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb. 4, 1928	Corresponding week 1927	
Denver	103	18.3	15.1	15	11	
Des Moines	31	10.7	7.0	2	3	33
Duluth	22	9.8	10.5	1	1	23
El Paso	40	17.8	14.7	5	4	
Erie	23			1	3	21
Fall River [4]	21	8.2	12.2	6	3	103
Flint	21	7.4	12.4	3	10	38
Fort Worth	40	12.4	11.2	0	4	
White	28		11.6	0	4	
Colored	12	(5)	8.0	0	0	
Grand Rapids	27	8.6	10.6	2	7	30
Houston	61			8	11	
White	49			6	9	
Colored	12	(5)		2	2	
Indianapolis	100	13.7	14.2	14	11	107
White	84		14.1	10	9	87
Colored	16	(5)	15.1	4	2	243
Jersey City	85	13.7	12.0	14	7	105
Kansas City, Kans	32	14.1	13.3	2	6	42
White	25		14.1	2	5	49
Colored	7	(5)	9.8	0	1	0
Kansas City, Mo	113	15.1	13.5	9	18	64
Knoxville	31	15.4	16.3	3	1	65
White	23		13.9	3	1	73
Colored	8	(5)	34.2	0	0	0
Los Angeles	240			11	21	31
Louisville	48	7.6	15.3	6	4	50
White	35		12.7	5	1	48
Colored	13	(5)	29.9	1	3	69
Lowell	20	9.5	14.2	1	4	21
Lynn	30	14.9	14.9	2	2	50
Memphis	68	18.7	16.6	4	4	47
White	37		14.4	2	0	37
Colored	31	(5)	20.6	2	4	63
Milwaukee	121	11.6	10.8	12	15	54
Minneapolis	108	12.4	11.6	5	9	30
Nashville	47	17.7	19.7	1	7	16
White	30		19.0	0	7	0
Colored	17	(5)	21.4	1	0	60
New Bedford	32	14.0	20.9	9	8	195
New Haven	36	10.0	12.4	1	2	14
New Orleans	143	17.4	17.2	18	16	87
White	87		14.6	9	9	65
Colored	56	(5)	24.6	9	7	131
New York	1,607	14.0	13.7	177	172	71
Bronx Borough	194	10.7	11.5	12	17	36
Brooklyn Borough	534	12.1	12.3	75	65	75
Manhattan Borough	651	19.4	18.3	69	70	82
Queens Borough	170	10.4	9.9	18	18	72
Richmond Borough	58	20.1	15.3	3	2	54
Newark, N. J	107	11.8	12.5	15	15	77
Oakland	64	12.2	11.3	4	5	43
Oklahoma City	36			0	5	
Omaha	73	17.1	17.4	4	7	46
Paterson	43	15.5	16.3	5	4	87
Philadelphia	513	13.0	14.7	48	51	65
Pittsburgh	164	12.8	17.7	22	29	72
Portland, Oreg	73			7	9	75
Providence	65	11.9	12.6	6	7	52
Richmond	45	12.1	15.5	5	2	65
White	29		13.4	3	0	61
Colored	16	(5)	20.6	2	2	73
Rochester	90	14.3	13.5	8	9	65
St. Louis	259	16.0	14.2	14	13	47
St. Paul	56	11.6	9.6	2	7	19
Salt Lake City [4]	28	10.6	16.1	2	5	33
San Antonio	53	12.7	14.8	6	5	
San Diego	49	21.4	19.0	3	4	57
San Francisco	185	16.5	18.0	8	10	50
Schenectady	24	13.4	13.4	2	3	63

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended February 4, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 8, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Feb. 4, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 4, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb. 4, 1928	Corresponding week 1927	
Somerville	22	11.2	9.8	6	3	207
Spokane	26	12.5	12.4	1	2	26
Springfield, Mass	42	14.7	12.7	5	4	79
Syracuse	59	15.5	16.1	3	9	36
Tacoma	26	12.3	11.2	2	2	51
Toledo	76	12.7	11.6	5	8	48
Trenton	31	11.7	15.3	2	3	34
Washington, D. C	150	14.2	15.9	9	17	51
White	107		12.9	5	9	41
Colored	43	(5)	24.9	4	8	74
Waterbury	24			2	5	58
Wilmington, Del	27	11.0	9.1	0	0	0
Worcester	47	12.4	15.2	4	5	49
Yonkers	24	10.3	8.8	3	7	68
Youngstown	34	10.2	13.9	4	6	53

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 36 cities.
[4] Deaths for week ended Friday, Feb. 3, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15, Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32, and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended February 12, 1927, and February 11, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 12, 1927, and February 11, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928
New England States:								
Maine	1	5	12	4	280	44	0	0
New Hampshire	------	2	------	20	------	73	------	0
Vermont	3	1	------	------	101	4	0	0
Masachusetts	116	117	17	14	[illegible]	1,598	0	2
Rhode Island	6	13	------	------	------	5	0	0
Connecticut	31	43	5	3	121	280	2	1
Middle Atlantic States:								
New York	313	401	[1] 102	[1] 40	708	1,461	6	11
New Jersey	106	145	31	31	49	423	2	1
Pennsylvania	204	238	------	------	942	1,129	3	2
East North Central States:								
Ohio	------	193	------	32	------	352	------	2
Indiana	31	49	44	30	261	162	0	0
Illinois	111	191	37	40	1,854	101	2	7
Michigan	103	78	------	4	117	191	0	2
Wisconsin	41	38	131	75	765	95	10	3
West North Central States:								
Minnesota	32	29		------	446	2	2	1
Iowa [2]	28	24	------	------	425	65	2	0
Missouri	61	51	11	8	198	97	1	4
North Dakota	3	3	4	------	131	17	2	0
South Dakota	11	9	2	------	130	14	0	2
Nebraska	4	21	25	10	204	3	1	1
Kansas	31	45	2	39	387	22	0	0
South Atlantic States:								
Delaware	2	------	1	4	4	8	0	1
Maryland [2]	55	23	63	35	24	563	0	1
District of Columbia	25	31	12	1	3	36	0	0
Virginia	------	------	------	------	------	------	------	------
West Virginia	27	13	37	24	164	85	0	0
North Carolina	34	46	------	------	227	4,734	1	1
South Carolina	28	19	1,363	1,246	29	1,428	0	0
Georgia	25	12	174	220	139	196	1	0
Florida	48	19	18	15	35	24	2	0
East South Central States:								
Kentucky	------	5	------	11	------	296	------	0
Tennessee	13	14	70	115	72	329	4	2
Alabama	36	33	131	287	180	192	3	0
Mississippi	12	27	------	------	------	------	------	------

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 12, 1927, and February 11, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928
West South Central States:								
Arkansas	10	13	99	189	16	491	0	0
Louisiana	73	23	41	71	110	197	0	0
Oklahoma [3]	22	23	242	221	126	134	1	2
Texas	57	48	70	146	18	195	0	1
Mountain States:								
Montana	5	11			113	3	1	7
Idaho	1				93		1	
Wyoming	3	2	1		379	23	0	1
Colorado		41		3		82		16
New Mexico	4	3	5	47	21	151	0	0
Arizona	1	24		1	29	27	1	6
Utah [2]	4		3	3	263	3	0	1
Nevada								
Pacific States:								
Washington	37	7	7		259	275	6	6
Oregon	17	16	331	29	75	46	1	0
California	130	113	101	56	2,377	140	7	10

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928
New England States:								
Maine	0	0	17	27	0	0	3	2
New Hampshire		0		40		0		0
Vermont	0	0	8	12	0	0	0	0
Massachusetts	1	2	499	350	0	0	9	6
Rhode Island	0	0	21	44	0	0	0	1
Connecticut	0	0	101	114	0	6	0	2
Middle Atlantic States:								
New York	3	3	816	828	10	16	20	14
New Jersey	0	0	296	306	0	1	3	6
Pennsylvania	0	4	724	605	1	0	33	16
East North Central States:								
Ohio		3		415		27		7
Indiana	0	0	451	143	128	101	5	5
Illinois	1	2	326	366	38	42	16	19
Michigan	0	3	328	363	38	32	6	7
Wisconsin	0	4	232	196	11	14	0	2
West North Central States:								
Minnesota	0	0	281	159	19	1	4	3
Iowa [1]	1	0	78	102	10	66	9	2
Missouri	0	0	159	109	6	62	6	0
North Dakota	0	0	58	47	11	3	2	4
South Dakota	0	2	106	90	2	9	0	0
Nebraska	0	1	41	101	15	53	1	3
Kansas	1	0	183	128	49	109	1	0
South Atlantic States:								
Delaware	0	0	28	2	0	0	0	0
Maryland [2]	0	0	99	62	0	0	11	5
District of Columbia	0	0	18	42	0	0	1	0
Virginia		1				0		0
West Virginia	0	0	70	56	12	41	17	14
North Carolina	0	0	56	46	45	142	5	2
South Carolina	3	1	17	6	7	15	7	4
Georgia	0	0	32	11	143	0	4	4
Florida	0	0	10	18	59	10	5	2
East South Central States:								
Kentucky		0		38		13		3
Tennessee	0	1	65	26	14	10	12	5
Alabama	0	0	16	14	57	10	4	8
Mississippi	0	0	11	20	11	11	5	4
West South Central States:								
Arkansas	0	0	19	66	3	16	6	7
Louisiana	0	0	15	17	6	23	12	10
[illegible]	0	1	47	46	52	135	17	18
[illegible]			[illegible]	[illegible]	[illegible]	120	0	6

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 12, 1927, and February 11, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928
Mountain States:								
Montana	0	0	113	20	7	27	0	0
Idaho	0		30		3		2	
Wyoming	0	0	23	24	0	2	0	0
Colorado		1		137		14		2
New Mexico	0	0	32	31	4	0	4	3
Arizona	0	0	58	13	1	16	0	2
Utah [2]	0	1	17	5	1	4	1	1
Nevada								
Pacific States:								
Washington	0	1	128	48	39	70	2	4
Oregon	0	2	46	22	11	44	8	0
California	2	12	267	188	21	20	10	5

[2] Week ended Friday.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December, 1927										
Hawaii Territory	3	30	4		7		2	2	0	6
Indiana	3	216	127		178		11	421	[1] 357	24
Oregon	9	63	110		82		64	134	180	22
Virginia	3	279	2,421	45	743	13	2	287	3	34
January, 1928										
Arizona	10	60			64	2	2	24	9	7
Connecticut	2	177	23	1	606		3	496	125	5
Florida	2	67	43	22	29	1		45	19	30
Nebraska	8	40	17		37			322	161	6

[1] Corrected report.

December, 1927	Cases
Chicken pox:	
Hawaii Territory	18
Indiana	322
Oregon	249
Virginia	583
Conjunctivitis:	
Hawaii Territory	58
Dysentery:	
Virginia	41
Favus:	
Oregon	1
Hookworm disease:	
Virginia	7
Impetigo contagiosa:	
Oregon	9
Leprosy:	
Hawaii Territory	2
Lethargic encephalitis:	
Oregon	1
Mumps:	
Hawaii Territory	18
Indiana	68
Oregon	62
Paratyphoid fever:	
Hawaii Territory	2
Scabies:	
Oregon	26
Septic sore throat:	
Oregon	7
Tetanus:	
Hawaii Territory	1
Trachoma:	
Hawaii Territory	101
Trench mouth:	
Oregon	1
Whooping cough:	
Indiana	77
Oregon	18
Virginia	401
January, 1928	
Anthrax:	
Nebraska	1
Chicken pox:	
Arizona	51
Connecticut	582
Florida	172
Nebraska	274
Conjunctivitis:	
Connecticut	3
Dengue:	
Florida	2

	Cases
Dysentery:	
Florida	5
Favus:	
Connecticut	1
German measles:	
Connecticut	17
Nebraska	4
Hookworm disease:	
Florida	57
Lethargic encephalitis:	
Connecticut	3
Mumps:	
Arizona	17
Connecticut	390
Florida	19
Nebraska	125
Paratyphoid fever:	
Connecticut	3

	Cases
Rabies in animals:	
Connecticut	3
Rabies in man:	
Arizona	1
Septic sore throat:	
Connecticut	12
Nebraska	9
Tetanus:	
Connecticut	2
Florida	8
Trachoma:	
Arizona	10
Typhus fever:	
Florida	2
Whooping cough:	
Arizona	24
Connecticut	516
Florida	6
Nebraska	47

Number of cases of certain communicable diseases reported for the month of November, 1927, by State health officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	81	434	75	33	138	28	300	100	77
Arizona	40	74	57	4	19	0	116	9	29
Arkansas	136	171	89	22	88	11	[1] 64	82	62
California	1,346	747	261	348	794	52	916	46	504
Colorado [2]									
Connecticut	525	136	105	193	223	0	114	18	332
Delaware	8	12	42	35	15	0	3	4	11
District of Columbia	63	92	4		109	2	90	9	20
Florida	14	161	6	23	47	8	59	17	5
Georgia	58	178	86	21	112	7	44	85	12
Idaho	104	15	12	97	105	36	[1] 7	2	9
Illinois	1,402	787	120	523	999	120	850	122	731
Indiana	272	245	44	16	481	237	158	27	86
Iowa	180	96	7	143	227	185	39	12	25
Kansas	702	154	216	61	447	139	156	19	222
Kentucky [3]									
Louisiana	56	252	85	22	80	30	[1] 189	60	38
Maine	154	14	190	70	189	0	16	18	48
Maryland	378	177	206	53	223	0	219	72	110
Massachusetts	958	542	1,221	402	968	1	474	39	606
Michigan	659	493	530	548	814	71	453	62	408
Minnesota	678	240	16		632	5	337	24	38
Mississippi	615	351	1,593	448	184	17	279	68	1,030
Missouri	263	372	65	158	390	308	185	86	159
Montana	107	11	2	1	100	109	31	4	28
Nebraska	186	73	36	72	148	33	15	15	59
Nevada [4]									
New Hampshire		15			37			1	
New Jersey	738	747	212		477	0	364	41	630
New Mexico [2]									
New York	1,840	1,515	738	985	1,280	35	1,919	204	1,511
North Carolina	351	615	2,479		520	90		64	448
North Dakota	136	16	20	8	195	35	12	6	10
Ohio	1,473	987	193	514	1,013	46	565	109	403
Oklahoma [5]	157	392	124	15	147	94	43	146	23
Oregon	133	80	69	30	87	135	35	32	17
Pennsylvania	2,832	1,187	1,735	1,292	1,626	0	656	132	711
Rhode Island	31	123	9	90	122	1	42	5	12
South Carolina	118	599	758		155	37	140	128	301
South Dakota	37	25	70	21	191	13	6	13	20
Tennessee	128	247	386	32	223	19	114	138	59
Texas [2]									
Utah [3]									
Vermont	205	10	22	45	47	0	[1] 10	0	154
Virginia	632	564	654		404	24	[1] 145	94	369
Washington	435	179	633	274	210	104	181	25	38
West Virginia	179	99	48		238	18	35	62	32
Wisconsin	898	149	322	237	460	99	121	15	254
Wyoming	112	8	33	4	88	33	1	3	74

[1] Pulmonary.
[2] Report not received at time of going to press.
[3] Reports received weekly.
[4] Reports received annually.
[5] Exclusive of Oklahoma City and Tulsa.

Case rates per 1,000 population (annual basis) for the month of November, 1927

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	0.39	2.07	0.36	0.16	0.66	0.13	1.43	0.48	0.37
Arizona	1.06	1.96	1.51	.11	.50	.00	3.07	.24	.77
Arkansas	.86	1.08	.56	.14	.56	.07	[1] .40	.52	.39
California	3.69	2.05	.72	.96	2.18	.14	2.51	.13	1.38
Colorado [2]	-----	-----	-----	-----	-----	-----	-----	-----	-----
Connecticut	3.90	1.01	.78	1.44	1.66	.00	.85	.13	2.47
Delaware	.40	.60	2.10	1.75	.75	.00	.15	.20	.55
District of Columbia	1.42	2.07	.09	-----	2.46	.05	2.03	.20	.45
Florida	.12	1.44	.05	.21	.42	.07	.53	.15	.04
Georgia	.22	.68	.33	.08	.43	.03	.17	.33	.05
Idaho	2.37	.34	.27	2.21	2.39	.82	[1] .16	.05	.21
Illinois	2.34	1.31	.20	.87	1.67	.20	1.42	.20	1.22
Indiana	1.05	.95	.17	.06	1.86	.92	.61	.10	.33
Iowa	.90	.48	.04	.72	1.14	.93	.20	.06	.13
Kansas	4.67	1.03	1.44	.41	2.98	.93	1.04	.13	1.48
Kentucky [3]	-----	-----	-----	-----	-----	-----	-----	-----	-----
Louisiana	.35	1.59	.53	.14	.50	.19	[1] 1.19	.38	.24
Maine	2.36	.21	2.92	1.07	2.90	.00	.25	.28	.74
Maryland	2.88	1.35	1.57	.40	1.70	.00	1.67	.55	.84
Massachusetts	2.75	1.55	3.50	1.15	2.78	.00	1.36	.11	1.74
Michigan	1.79	1.34	1.44	1.49	2.21	.19	1.23	.17	1.11
Minnesota	3.07	1.09	.07	-----	2.86	.02	1.53	.11	.17
Mississippi	4.18	2.39	10.82	3.04	1.25	.12	1.90	.46	7.00
Missouri	.91	1.29	.23	.55	1.35	1.07	.64	.30	.55
Montana	2.85	.19	.03	.02	1.70	1.86	.53	.07	.48
Nebraska	1.62	.64	.31	.63	1.29	.29	.13	.13	.51
Nevada [4]	-----	-----	-----	-----	-----	-----	-----	-----	-----
New Hampshire	-----	.40	-----	-----	.99	-----	-----	.03	-----
New Jersey	2.39	2.42	.69	-----	1.55	-----	1.18	.13	2.04
New Mexico [3]	-----	-----	-----	-----	-----	-----	-----	-----	-----
New York	1.96	1.61	.79	1.05	1.36	.04	2.04	.22	1.61
North Carolina	1.47	2.58	10.41	-----	2.18	.38	-----	.27	1.88
North Dakota	2.58	.30	.38	.15	3.70	.66	.23	.11	.19
Ohio	2.67	1.79	.35	.93	1.84	.08	1.02	.20	.73
Oklahoma [5]	.90	2.25	.71	.09	.84	.54	.25	.84	.13
Oregon	1.82	1.09	.94	.41	1.19	1.85	.48	.44	.23
Pennsylvania	3.54	1.48	2.17	1.62	2.03	.00	.82	.17	.89
Rhode Island	.54	2.13	.16	1.56	2.11	.02	.73	.09	.21
South Carolina	.78	3.05	5.00	-----	1.02	.24	.92	.84	1.98
South Dakota	.65	.44	1.22	.37	3.34	.23	.10	.23	.35
Tennessee	.63	1.21	1.89	.16	1.09	.09	.56	.68	.29
Texas [2]	-----	-----	-----	-----	-----	-----	-----	-----	-----
Utah [3]	-----	-----	-----	-----	-----	-----	-----	-----	-----
Vermont	7.08	.35	.76	1.55	1.62	.00	[1] .35	.00	5.32
Virginia	3.02	2.70	3.13	-----	1.93	.11	[1] .69	.45	1.70
Washington	3.39	1.39	4.93	2.13	1.61	.81	1.41	.19	.30
West Virginia	1.28	.71	.34	-----	1.71	.13	.25	.44	.23
Wisconsin	3.74	.62	1.34	.99	2.00	.41	.50	.06	1.06
Wyoming	5.65	.40	1.67	.20	4.44	1.67	.05	.15	3.74

[1] Pulmonary.
[2] Report not received at time of going to press.
[3] Reports received weekly.
[4] Reports received annually.
[5] Exclusive of Oklahoma City and Tulsa.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 96 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,890,000. The estimated population of the 91 cities reporting deaths is about 30,230,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended January 28, 1928, and January 29, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	2,182	2,001	
96 cities	1,147	1,049	1,063
Measles:			
42 States	12,410	9,972	
96 cities	3,398	2,524	
Poliomyelitis:			
43 States	51	25	
Scarlet fever:			
43 States	4,793	5,964	
96 cities	1,644	2,262	1,471
Smallpox:			
43 States	1,164	1,070	
96 cities	137	151	111
Typhoid fever:			
43 States	247	217	
96 cities	50	43	45
Deaths reported			
Influenza and pneumonia:			
91 cities	1,035	1,041	
Smallpox:			
91 cities	0	0	

City reports for week ended January 28, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	2	1	1	0	0	1	9	1
New Hampshire:									
Concord	[1] 22,546	0	1	0	0	0	2	0	1
Manchester	84,000	0	2	0	0	0	4	0	1
Vermont:									
Barre	[1] 10,008	1	1	0	0	0	0	0	0
Burlington	[1] 24,089	2	1	0	0	0	0	0	2
Massachusetts:									
Boston	787,000	90	55	26	3	2	347	6	27
Fall River	131,000	2	6	6	2	0	0	0	1
Springfield	145,000	9	3	9	1	0	1	49	1
Worcester	193,000	13	6	0	2	0	3	81	1
Rhode Island:									
Pawtucket	71,000	8	2	1	0	0	0	5	4
Providence	275,000	4	10	15	0	0	0	10	3
Connecticut:									
Bridgeport	([2])	6	8	6	3	1	3	4	3
Hartford	164,000	16	8	9	0	0	2	3	5
New Haven	182,000	8	3	2	0	0	110	24	8

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended January 28, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	31	15	18		0	412	44	18
New York	5,924,000	218	213	351	33	20	179	21	229
Rochester	321,000	17	13	9		0	7	15	8
Syracuse	185,000	30	5	0		0	69	6	2
New Jersey:									
Camden	131,000	1	5	14	0	0	1	0	3
Newark	459,000	29	16	23	7	0	102	20	16
Trenton	134,000	1	5	4	0	0	3	0	5
Pennsylvania:									
Philadelphia	2,008,000	135	82	59		6	61	129	59
Pittsburgh	637,000	42	20	36		6	157	93	30
Reading	114,000	20	4	2		0	0	1	5
Scranton	143,000	17		18			0	0	
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	25	11	10	0	1	248	4	11
Cleveland	960,000	89	35	86	4	3	26	169	17
Columbus	285,000		5						
Toledo	295,000	57	9	4	3	2	128	17	6
Indiana:									
Fort Wayne	98,900	2	4	2	0	0	1	0	4
Indianapolis	367,000	15	10	9	0	1	29	58	16
South Bend	81,700	5	1	0	0	0	0	0	1
Terre Haute	71,900	5	1	2	0	1	0	0	0
Illinois:									
Chicago	3,048,000	147	94	106	12	3	18	44	76
Springfield	64,700	7	1	1	1	0	0	24	0
Michigan:									
Detroit	1,290,000	57	67	37	4	3	221	36	30
Flint	136,000	25	7	7	0	0	2	82	3
Grand Rapids	156,000	3	3	0	0	0	10	15	1
Wisconsin:									
Kenosha	52,700	22	2	0	0	0	0	4	0
Milwaukee	517,000	69	22	16	6	5	5	31	17
Racine	69,400		2						
Superior	[1] 39,671	0	1	0	0	0	0	0	3
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	5	2	0	0	0	0	2	1
Minneapolis	434,000	74	20	13	0	1	2	11	8
St. Paul	248,000	20	14	3	0	1	0	56	8
Iowa:									
Davenport	[1] 52,469	1	1	0	0		0	0	
Des Moines	146,000	0	3	0	0		0	0	
Sioux City	78,000	8	1	0	0		20	32	
Waterloo	36,900	1	1	0	0		0	1	
Missouri:									
Kansas City	375,000	20	9	3	0	1	7	110	12
St. Joseph	78,400	5	2	1	0	0	1	6	3
St. Louis	830,000	23	51	37	0	0	40	22	
North Dakota:									
Fargo	[1] 26,403	12	0	0	0	1	0	8	1
Grand Forks	[1] 14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	2	0	0	0		1	0	
Sioux Falls	[1] 30,127	0	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	15	2	0	0	0	0	12	0
Omaha	216,000	16	5	5	0	0	0	1	7
Kansas:									
Topeka	56,500	22	2	4	1	1	0	1	3
Wichita	92,500	2	4	1	0	0	1	2	5

[1] Estimated, July 1, 1925.

City reports for week ended January 28, 1928—**Continued**

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	2	3	5	0	0	0	8	1
Maryland:									
Baltimore	808,000	171	40	14	22	1	302	18	35
Cumberland	[1] 33,741	1	1	0	0	0	0	0	0
Frederick	[1] 12,035	2	1	0	0	0	0	0	1
District of Columbia:									
Washington	528,000	33	22	34	9	3	20	0	19
Virginia:									
Lynchburg	30,500	9	2	3	0	0	0	0	3
Norfolk	174,000	28	2	5	0	0	12	0	6
Richmond	189,000	8	5	7	0	0	43	0	6
Roanoke	61,900	7	2	1	0	0	6	1	4
West Virginia:									
Charleston	50,700	0	1	3	0	0	0	0	2
Wheeling	[1] 56,208	4	1	0	0	0	3	0	4
North Carolina:									
Raleigh	[1] 30,371	10	1	0	0	0	21	0	4
Wilmington	37,700	7	0	0	0	0	62	0	2
Winston-Salem	71,800	0	0	1	2	0	75	14	1
South Carolina:									
Charleston	74,100	0	0	2	46	0	2	0	7
Columbia	41,800	8	1	1	0	1	150	18	3
Greenville	[1] 27,311		0						
Georgia:									
Atlanta	(²)	6	3	5	73	1	10	10	12
Brunswick	[1] 16,809	0	0	0	0	0	6	4	1
Savannah	94,900	4	1	0	12	0	68	3	6
Florida:									
Miami	[1] 69,754	6		2	0	0	0	1	1
St. Petersburg	[1] 26,847		0			0			0
Tampa	102,000	14	1	2	0	0	0	0	1
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	2	1	0	0	0	14	0	3
Louisville	311,000		7						
Tennessee:									
Memphis	177,000	8	5	6	0	0	195	5	8
Nashville	137,000	2	1	0	0	8	2	2	4
Alabama:									
Birmingham	211,000	15	3	3	40	5	11	2	7
Mobile	66,800	1	0	2	0	0	0	0	0
Montgomery	47,000	2	0	1	0		1	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643		1						
Little Rock	75,900	0	1	3	0	0	65	0	4
Louisiana:									
New Orleans	419,000	4	13	13	17	12	2	0	18
Shreveport	59,500	7	2	1	0	0	23	0	4
Oklahoma:									
Oklahoma City	(²)	3	1	2	0	0	10	0	6
Tulsa	138,000	2	2	2	0		0	6	
Texas:									
Dallas	203,000		7	7	2	2	2		9
Fort Worth	159,000	19	3	11	1	0	1	1	4
Galveston	49,100	0	1	0	0	0	0	0	3
Houston	[1] 164,954	7	6	12	1	1	4	1	13
San Antonio	205,000	1	2	5	0	4	28	3	14
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	1	0	0	0	0	0	0
Great Falls	[1] 29,883	1	1	1	0	1	0	0	0
Helena	[1] 12,037	1	0	0	0	0	0	0	1
Missoula	[1] 12,668	1	0	0	0	0	0	0	0

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended January 28, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
MOUNTAIN—contd.									
Idaho:									
Boise	1 23,042	3	0	0	0	0	0	1	0
Colorado:									
Denver	285,000	25	12	8	-------	5	9	77	14
Pueblo	43,900	13	2	2	0	1	0	0	3
New Mexico:									
Albuquerque	1 21,000	5	0	0	0	0	28	3	0
Utah:									
Salt Lake City	133,000	27	3	3	0	2	1	1	2
Nevada.									
Reno	1 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	24	6	2	0	-------	121	13	-------
Spokane	109,000	22	4	0	0	-------	0	0	-------
Tacoma	106,000	7	3	1	0	1	8	6	3
Oregon:									
Portland	1 282,383	31	10	4	1	0	5	4	7
California									
Los Angeles	(2)	54	46	48	29	4	9	17	32
Sacramento	73,400	27	3	0	0	0	7	0	1
San Francisco	567,000	119	22	12	1	1	25	28	7

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	8	0	0	0	0	0	0	0	8	22
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	12
Manchester	3	3	0	0	0	1	0	0	0	0	12
Vermont:											
Barre	0	1	0	0	0	0	0	0	0	0	3
Burlington	1	2	0	0	0	0	0	0	0	4	11
Massachusetts:											
Boston	85	65	0	0	0	20	1	4	0	74	210
Fall River	3	6	0	0	0	2	0	3	1	1	26
Springfield	9	19	0	0	0	2	0	0	0	9	34
Worcester	12	3	0	0	0	5	0	0	0	10	52
Rhode Island:											
Pawtucket	1	9	0	0	0	0	0	2	0	0	22
Providence	9	35	0	0	0	2	0	0	0	1	66
Connecticut:											
Bridgeport	12	5	0	0	0	3	0	0	0	1	31
Hartford	8	11	0	0	0	1	0	0	1	4	42
New Haven	11	0	0	0	0	3	0	0	0	21	39
MIDDLE ATLANTIC											
New York:											
Buffalo	26	58	0	0	0	3	1	0	0	27	152
New York	263	337	0	0	0	103	10	5	1	224	1,523
Rochester	13	5	0	1	0	5	0	0	0	3	82
Syracuse	15	18	0	0	0	0	1	0	0	21	47
New Jersey:											
Camden	6	5	0	0	0	1	0	0	0	0	27
Newark	28	30	0	0	0	7	0	0	0	39	118
Trenton	6	6	0	0	0	1	0	0	0	3	33

1 Estimated, July 1, 1925.

2 No estimate made.

City reports for week ended January 28, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
MIDDLE ATLANTIC—continued											
Pennsylvania:											
Philadelphia	96	82	0	0	0	25	3	2	0	73	525
Pittsburgh	45	22	0	0	0	5	0	4	0	20	207
Reading	1	34	0	0	0	2	1	0	0	0	19
Scranton		6		0				0		9	
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	21	17	1	0	0	9	0	0	0	2	110
Cleveland	44	46	1	0	0	18	1	1	1	64	232
Columbus	12		1				1				
Toledo	15	14	1	1	0	2	1	0	0	7	65
Indiana:											
Fort Wayne	7	2	0	0	0	1	0	1	0	1	25
Indianapolis	9	24	12	3	0	1	0	0	0	5	106
South Bend	3	0	0	0	0	0	0	0	0	0	9
Terre Haute	4	1	1	3	0	0	0	0	0	0	14
Illinois:											
Chicago	144	145	2	3	0	52	3	5	0	148	21
Springfield	2	15	0	0	0	2	1	1	0	0	25
Michigan:											
Detroit	105	106	3	2	0	34	1	0	1	75	298
Flint	9	15	1	2	0	1	0	0	0	4	26
Grand Rapids	13	8	0	0	0	0	0	0	0	8	18
Wisconsin:											
Kenosha	1	9	0	2	0	0	0	0	0	2	3
Milwaukee	30	51	2	4	0	5	1	0	0	25	102
Racine	7		0				0				
Superior	4	0	2	0	0	1	0	0	0	0	13
WEST NORTH CENTRAL											
Minnesota:											
Duluth	10	3	1	0	0	2	1	1	0	3	15
Minneapolis	62	23	6	1	0	3	1	2	0	1	84
St. Paul	36	15	7	1	0	1	1	0	0	11	49
Iowa:											
Davenport	1	6	2	3			0	0		0	
Des Moines	7	16	2	21			0	0		0	
Sioux City	2	2	2	0			0	1		0	
Waterloo	2	7	0	0			0	0		0	
Missouri:											
Kansas City	14	22	3	4	0	7	0	0	0	4	101
St. Joseph	3	1	1	25	0	2	0	0	0	0	22
St. Louis	51	39	3	0	0	9	1	0	0	30	245
North Dakota:											
Fargo	2	4	0	0	0	1	0	0	0	5	10
Grand Forks	0	2	1	0			0	0		0	
South Dakota:											
Aberdeen	1	0	0	0			0	0		0	
Sioux Falls	3	2	0	0			0	0		0	10
Nebraska:											
Lincoln	4	3	0	12	0	0	0	1	0	12	18
Omaha	4	15	10	1	0	1	0	0	0	1	48
Kansas:											
Topeka	2	3	0	5	0	0	0	0	0	11	21
Wichita	6	6	0	25	0	0	0	0	0	0	29
SOUTH ATLANTIC											
Delaware:											
Wilmington	7	1	0	0	0	0	0	0	0	1	32
Maryland:											
Baltimore	47	33	0	2	0	12	2	0	1	25	236
Cumberland	2	0	0	0	0	0	0	0	0	0	3
Frederick	1	1	0	0	0	0	0	0	0	0	7
District of Columbia:											
Washington	28	39	1	0	0	12	1	2	1	11	147

City reports for week ended January 28, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
Virginia:											
Lynchburg	0	0	0	0	0	0	0	0	0	4	8
Norfolk	2	14	0	0	0	1	1	0	0	0	...
Richmond	5	7	0	0	0	1	0	0	0	0	57
Roanoke	1	5	0	0	0	1	0	0	0	2	16
West Virginia:											
Charleston	1	2	0	2	0	0	1	0	0	0	9
Wheeling	2	3	0	0	0	0	0	0	0	1	15
North Carolina:											
Raleigh	1	1	0	0	0	1	0	0	0	0	19
Wilmington	1	0	0	0	0	0	0	0	0	0	12
Winston-Salem	2	0	4	0	0	1	0	0	0	0	28
South Carolina:											
Charleston	0	1	1	0	0	2	0	0	0	0	26
Columbia	0	0	1	0	0	0	0	0	0	1	35
Greenville	0	...	0	...	...	...	0	...	...	...	...
Georgia:											
Atlanta	4	5	4	0	0	2	0	0	0	1	67
Brunswick	0	0	0	0	0	0	0	0	0	0	3
Savannah	1	0	0	4	0	3	1	1	0	0	37
Florida:											
Miami	...	3	...	0	0	2	...	1	0	0	34
St. Petersburg	0	...	0	...	0	0	0	...	0	...	15
Tampa	0	2	0	0	0	2	2	1	0	0	27
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	2	0	1	0	1	0	0	0	1	18
Louisville	6	...	1	...	...	...	1	...	...	...	...
Tennessee:											
Memphis	7	7	2	1	0	2	0	1	0	4	59
Nashville	3	0	0	0	0	2	0	1	0	1	51
Alabama:											
Birmingham	3	4	4	2	0	9	1	2	0	2	64
Mobile	0	3	1	0	0	3	0	0	0	0	27
Montgomery	0	0	1	0	...	...	0	0	...	2	...
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	...	0	...	...	...	0	...	...	...	...
Little Rock	1	2	0	2	0	9	0	0	0	0	...
Louisiana:											
New Orleans	6	3	0	0	0	20	2	2	0	6	176
Shreveport	0	7	0	0	0	2	0	0	0	0	29
Oklahoma:											
Oklahoma City	2	2	2	0	0	1	0	0	0	0	26
Tulsa	1	4	1	4	...	...	0	0	...	1	...
Texas:											
Dallas	4	9	2	1	0	6	1	4	0	...	55
Fort Worth	1	7	1	2	0	1	1	0	0	0	34
Galveston	0	0	0	0	0	2	0	4	0	0	17
Houston	2	5	2	2	0	9	0	0	0	0	74
San Antonio	1	5	0	0	0	14	0	0	0	0	70
MOUNTAIN											
Montana:											
Billings	1	5	0	0	0	0	0	0	0	1	8
Great Falls	3	4	1	6	0	0	0	0	0	0	6
Helena	1	2	0	2	0	1	0	0	0	0	4
Missoula	1	1	0	0	0	0	0	0	0	0	2
Idaho:											
Boise	1	0	1	0	0	0	0	0	0	0	6
Colorado:											
Denver	13	9	2	1	0	7	1	0	0	10	102
Pueblo	2	6	0	1	0	0	0	0	0	2	15

City reports for week ended January 28, 1928—**Continued**

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
MOUNTAIN—con.											
New Mexico:											
Albuquerque	2	5	0	0	0	7	0	0	0	0	16
Utah:											
Salt Lake City	4	7	2	4	0	1	0	0	0	6	30
Nevada:											
Reno	0	0	1	1	0	0	0	0	0	0	1
PACIFIC											
Washington:											
Seattle	13	10	4	1	--------	--------	0	0	--------	0	--------
Spokane	4	25	5	15	--------	--------	0	0	--------	0	--------
Tacoma	3	5	4	0	0	0	1	0	0	0	27
Oregon:											
Portland	7	6	8	22	0	9	1	0	0	2	92
California:											
Los Angeles	32	30	6	5	0	25	2	0	0	12	294
Sacramento	2	3	1	0	0	4	0	0	0	0	32
San Francisco	16	43	3	2	0	11	1	0	0	5	178

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	1	0	0	0	0	2	1
Springfield	1	0	0	0	0	0	0	0	0
Rhode Island:									
Providence	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	6	2	4	0	0	0	1	3	0
Pennsylvania:									
Pittsburgh [1]	0	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	3	0	0	1	0	0	0	0	0
Toledo	1	0	0	0	0	0	0	0	0
Indiana:									
Fort Wayne	0	0	0	0	0	0	0	1	1
Indianapolis	1	2	0	0	0	0	0	0	0
Illinois:									
Chicago	1	1	0	0	0	0	1	0	0
Michigan:									
Detroit	0	0	0	0	0	0	0	1	0
Flint	0	0	0	0	0	0	0	1	0
Grand Rapids	0	0	0	0	0	0	0	1	0
Wisconsin:									
Milwaukee	4	1	0	0	0	0	0	0	0
Superior	0	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	2	0	0	0	0	0	0	0	0
Minneapolis	1	0	0	0	0	0	0	0	0
Iowa:									
Waterloo	1	--------	0	--------	0	--------	0	0	--------
Missouri:									
St. Louis	3	2	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	2	1	0	0	0	1	0

[1] Rabies (human): 1 death at Pittsburgh, Pa.

City reports for week ended January 28, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	1	1	0	0	0	0	0
Frederick	0	1	0	0	0	0	0	0	0
Virginia:									
Norfolk	0	0	1	0	0	0	0	0	0
West Virginia:									
Charleston	0	0	0	0	0	0	0	1	0
Georgia:									
Atlanta	0	0	0	0	0	0	0	0	1
Brunswick	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	0	1	0	0	0	0
Nashville	0	2	0	0	1	0	0	0	0
Alabama:									
Birmingham	1	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	1	0	1	0	2	1	0	0	0
Texas:									
Fort Worth	0	0	0	0	0	1	0	0	0
Houston [2]	1	1	0	0	0	0	0	1	0
San Antonio	0	0	0	0	0	1	0	0	0
MOUNTAIN									
Montana:									
Missoula	1	0	0	0	0	0	0	0	0
Colorado:									
Denver	3	1	0	0	0	0	0	0	1
Utah:									
Salt Lake City	1	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	0	-------	0	-------	0	-------	0	1	-------
California:									
Los Angeles	0	1	0	0	0	0	0	2	0
San Francisco	1	0	0	0	1	1	0	0	0

[2] Typhus fever: 1 case at Houston, Tex.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended January 28, 1928, compared with those for a like period ended January 29, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, December 25, 1927, to January 28, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926–27 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
101 cities	176	185	198	[2] 169	186	200	175	193	177	[3] 194
New England	158	165	158	149	174	200	151	168	163	172
Middle Atlantic	171	221	182	202	176	253	191	252	194	251
East North Central	193	200	223	176	189	220	170	192	175	[4] 189
West North Central	165	125	188	115	158	111	146	138	127	131
South Atlantic	173	129	222	[5] 154	215	142	161	146	198	[6] 147
East South Central	186	112	137	90	248	50	152	105	101	[7] 87
West South Central	223	264	252	[8] 246	244	204	170	152	263	[8] 168
Mountain	137	63	126	71	117	115	117	168	197	124
Pacific	155	141	230	123	193	143	232	125	167	161

MEASLES CASE RATES

	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
101 cities	231	322	384	[2] 518	330	566	451	619	425	[3] 575
New England	184	708	253	917	195	1,021	549	1,248	323	1,078
Middle Atlantic	22	331	31	466	38	500	49	478	46	483
East North Central	294	160	427	265	406	300	545	326	536	[4] 384
West North Central	61	46	259	134	192	109	277	259	297	138
South Atlantic	179	832	204	[5] 1,461	202	1,496	301	1,075	256	[6] 1,381
East South Central	78	397	106	1,566	96	1,521	203	1,387	188	[7] 1,621
West South Central	13	113	186	[8] 197	302	268	447	560	376	[8] 509
Mountain	3,545	36	5,227	62	3,434	106	5,074	97	4,447	88
Pacific	697	283	1,517	383	1,478	526	1,342	531	1,504	434

SCARLET FEVER CASE RATES

	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
101 cities	267	210	318	[2] 208	360	258	384	269	386	[3] 278
New England	356	346	491	340	470	308	537	508	539	372
Middle Atlantic	235	200	285	196	338	266	368	268	378	288
East North Central	245	257	288	234	345	285	336	286	347	[4] 301
West North Central	385	193	449	203	556	261	517	224	487	273
South Atlantic	238	149	231	[5] 152	258	168	280	207	253	[6] 202
East South Central	176	117	233	190	213	140	335	190	319	[7] 116
West South Central	150	126	153	[8] 168	141	124	194	83	112	[8] 127
Mountain	893	234	950	195	1,112	301	1,345	265	1,605	301
Pacific	252	126	340	184	376	220	319	240	326	296

SMALLPOX CASE RATES

	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
101 cities	14	15	22	[2] 17	22	28	20	22	26	[3] 23
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	1	0	0	0	1	0	1	0	0	0
East North Central	7	12	32	9	21	7	17	9	17	[4] 18
West North Central	40	79	57	105	69	146	59	121	79	121
South Atlantic	41	4	27	[5] 12	51	26	34	14	60	[6] 14
East South Central	47	10	41	5	86	15	25	55	86	[7] 29
West South Central	21	4	41	[8] 16	25	28	62	4	41	[8] 21
Mountain	9	144	0	106	0	142	0	106	9	133
Pacific	21	29	60	26	37	31	63	84	71	59

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1926, 1927, and 1928, respectively.
[2] Atlanta, Ga., and Fort Smith, Ark., not included.
[3] Columbus, Ohio, Racine, Wis., Greenville, S. C., Louisville, Ky., and Fort Smith, Ark., not included.
[4] Columbus, Ohio, and Racine, Wis., not included.
[5] Atlanta, Ga., not included.
[6] Greenville, S. C., not included.
[7] Louisville, Ky., not included.
[8] Fort Smith, Ark., not included.

Summary of weekly reports from cities, December 25, 1927, to January 28, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926–27—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
101 cities	12	7	8	[2] 5	9	8	7	6	7	[3] 8
New England	24	14	9	7	21	14	2	9	5	21
Middle Atlantic	7	4	6	3	8	5	5	3	4	5
East North Central	5	5	5	3	1	3	6	6	2	[4] 5
West North Central	4	10	8	2	6	8	4	2	8	8
South Atlantic	34	13	7	15	16	2	7	5	18	[6] 7
East South Central	21	10	25	20	15	55	10	30	35	[7] 29
West South Central	17	21	25	[8] 0	17	20	4	12	0	[8] 41
Mountain	27	18	9	9	9	0	27	9	18	0
Pacific	16	0	8	5	21	10	21	8	21	0

INFLUENZA DEATH RATES

	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
95 cities	17	19	20	[5] 19	21	24	21	24	25	[9] 10
New England	12	5	16	16	14	7	5	18	9	7
Middle Atlantic	21	14	18	13	20	21	20	19	22	16
East North Central	15	10	17	10	16	13	25	17	21	[4] 12
West North Central	8	8	14	4	10	14	4	18	4	10
South Atlantic	17	22	16	[5] 21	23	37	20	26	49	[6] 11
East South Central	26	56	48	89	37	78	16	105	32	[7] 101
West South Central	13	82	42	82	42	66	42	66	72	78
Mountain	46	72	63	53	99	62	54	71	72	80
Pacific	0	31	10	24	14	37	31	17	14	20

PNEUMONIA DEATH RATES

	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
95 cities	164	157	195	[5] 170	179	191	183	179	158	[9] 160
New England	172	146	181	103	191	179	207	156	158	126
Middle Atlantic	180	158	208	186	204	214	197	193	171	183
East North Central	134	135	169	140	152	158	138	137	132	[4] 123
West North Central	118	108	116	124	124	112	116	137	126	98
South Atlantic	187	188	229	[5] 231	189	252	278	231	189	[6] 209
East South Central	191	183	213	235	207	225	255	251	213	[7] 171
West South Central	150	310	238	238	178	287	195	308	200	267
Mountain	201	198	368	195	197	168	215	186	170	177
Pacific	198	138	210	176	169	142	134	142	107	145

[2] Atlanta, Ga., and Fort Smith, Ark., not included.
[3] Columbus, Ohio, Racine, Wis., Greenville, S. C., Louisville, Ky., and Fort Smith, Ark., not included.
[4] Columbus, Ohio, and Racine, Wis., not included.
[5] Atlanta, Ga., not included.
[6] Greenville, S. C., not included.
[7] Louisville, Ky., not included.
[8] Fort Smith, Ark., not included.
[9] Columbus, Ohio, Racine, Wis., Greenville, S. C., and Louisville, Ky., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended January 14, 1928.—The following report for the week ended January 14, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Suez.
Aden Protectorate.—Aden.
India.—Bombay, Rangoon, Moulmein.
Ceylon.—Colombo.
Dutch East Indies.—Makassar.

CHOLERA

India.—Bombay, Calcutta, Rangoon.
Straits Settlements.—Singapore.

CHOLERA—continued

Siam.—Bangkok.
French Indo-China.—Saigon-Cholon.

SMALLPOX

India.—Bombay, Negapatan, Madras, Calcutta, Rangoon, Moulmein.
French Indo-China.—Saigon-Cholon.
Dutch East Indies.—Belawan-Deli.
Sarawak.—Kuching.
China.—Hong Kong.

Returns for the week ended January 14 were not received from the following ports:

India.—Tuticorin, Vizagapatam, Bassein.
Dutch East Indies.—Pontianak.
China.—Canton.
Union of Socialist Soviet Republics.—Vladivostok.

ARGENTINA

Buenos Aires—Plague.—A death from plague was reported at Buenos Aires, Argentina, February 9, 1928. Unconfirmed newspaper reports announced four other deaths from plague in Buenos Aires.

Rosario—Plague—January 15–25, 1928.—According to information dated February 6, 1928, four cases of plague were reported at Rosario, Argentina, during the period January 15 to 25, 1928. The president of the Department of Hygiene of Argentina states that the work of destroying rats by poison, traps, and other measures is going on continuously at Rosario, that ships are being protected against rats, and that the spread of the disease is not anticipated. Similar measures are being taken at other ports in Argentina.

BAHAMA ISLANDS

Measles—Typhoid fever—March 1, 1927–January 28, 1928.—Information received under date of January 28, 1928, shows the occurrence of 86 cases of measles and 112 cases of typhoid fever with six deaths in the Bahama Islands during the period March 1, 1927, to January 28, 1928.

BOLIVIA

Water supply systems—Municipalities.—Information received under date of July 29, 1927, shows that the cities of Cochabamba, La Paz, Oruro, Potosi, Sucre, Santa Cruz, and Trinidad, Republic of Bolivia, have municipal water-supply systems, but that no system of filtration or purification of water exists in any of these localities. La Paz, Oruro, and Cochabamba are stated to have concrete sewers which are separate from the storm water drainage system. The other cities have only old subterranean canals of rubble masonry. Oruro receives its supply from the springs of Calacala; Cochabamba from Artesian wells; Potosi from reservoirs constructed in the Kari-kari mountains; Sucre from the waters of the Cajamarca River. It was stated that the water supply of La Paz was not free from mineral and organic impurities. The present water supply of La Paz was stated to be little in excess of 12 liters per day per capita, whereas it should be about 1,000 liters per day per capita.

BRAZIL

Pernambuco, Natal, Parahyba, Fortaleza—Health conditions—Vital Statistics, 1922–1926.—Health conditions in the cities named are said to be generally good, but the rural districts and smaller interior cities are more backward.

Yellow fever is said not to be a matter of great concern to Brazilians and, as at present controlled, not a grave menace to foreigners.

In 1925 and 1926 an epidemic of smallpox occurred in Pernambuco which affected neighboring States.

In 1926 two cases of bubonic plague occurred in Triumpho, Pernambuco, but the disease did not spread. A plague prevention post was established at Triumpho in 1927.

Some cases of typhoid fever and numerous cases of influenza are usually present in the State of Pernambuco. "Grippe intestinal" and dysentery are the diseases most often reported in the States of Rio Grande do Norte, Parahyba do Norte, and Ceara. Tuberculosis and malaria are said to be the chief causes of death in the States named.

Among the middle and upper classes hygienic and sanitary conditions are said to be good. The houses, as a rule, are kept clean. The storing of water in earthenware receptacles is a common practice, and flies are numerous.

American residents in this part of Brazil ordinarily observe sanitary precautions, drink boiled water or mineral water, avoid the use of raw vegetables, and take frequent vacations to minimize the effects of the tropical climate.

The following table gives vital statistics for the cities named for the years 1922 to 1926, inclusive:

CITY OF RECIFE (PERNAMBUCO)

	1922	1923	1924	1925	1926
Population	270,000	320,000	330,000	355,871	361,553
Births (living infants)	2,939	2,678	3,051	9,897	9,955
Births (stillborn)	915	923	916	958	913
Deaths	7,565	7,936	7,981	7,388	7,806
Death rate per thousand	28.0	25.3	24.4	20.7	24.4
Deaths under 2 years of age	1,953	2,069	1,977	1,829	1,973

CITY OF NATAL (RIO GRANDE DO NORTE)

	1922	1923	1924	1925	1926
Population	35,000	35,000	35,000	35,000	35,000
Births (living infants)	363	373	422	596	995
Births (stillborn)	84	110	82	92	98
Deaths	970	983	1,029	768	863
Death rate per thousand	27.7	28.0	29.4	21.9	24.6
Deaths under 2 years of age	502	482	511	345	415

CITY OF PARAHYBA (PARAHYBA DO NORTE)

	1922	1923	1924	1925	1926
Population	52,000	52,000	52,000	52,000	52,000
Births (living infants)	748	542	546	428	239
Births (stillborn)	89	106	124	138	127
Deaths	1,289	1,417	1,437	1,686	1,213
Death rate per thousand	24.7	27.2	27.6	32.4	23.3
Marriages	250	204	239	174	219
Infant mortality:					
Infants less than 1 year	550	449	530	485	490
Infants 1 to 2 years	95	117	47	118	61
Deaths:					
Cancer	8	9	6	10	6
Diphtheria, croup	6	Nil.	1	4	3
Dysentery	9	2	8	11	12
Grippe	4	3	4	6	71
Malaria	129	154	206	180	115
Smallpox	Nil.	Nil.	Nil.	*511*	Nil
Tuberculosis	194	203	234	129	162
Typhoid fever	6	11	8	4	13
Yellow fever	Nil.	Nil.	Nil.	2	17

CITY OF FORTALEZA (CEARA)

	1922	1923	1924	1925	1926
Population	90,000	90,000	90,000	95,000	100,000
Births (living infants)	1,461	818	858	863	894
Births (stillborn)	62	55	49	76	79
Deaths	2,318	2,300	2,795	2,076	2,639
Death rate per thousand	25.75	25.55	31.05	21.85	26.39
Deaths under 2 years of age	865	853	1,162	759	1,104

Rio de Janeiro—Plague.—Two cases of plague were reported in Rio de Janeiro, Brazil, recently. The first case occurred January 17, 1928. A plague-infected rat was reported January 16, 1928, in Rio de Janeiro.

CANADA

Provinces—Communicable diseases—Week ended January 28, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended January 28, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever			1	1		1		3
Influenza	4			12	2	1		19
Lethargic encephalitis					1			1
Smallpox				77	1	15	19	112
Typhoid fever	4	7	19	11	1		3	45

Quebec—Communicable diseases—Week ended January 28, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended January 28, 1928, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Scarlet fever	94
Chicken pox	32	Smallpox	18
Diphtheria	64	Tuberculosis	32
German measles	2	Typhoid fever	19
Influenza	1	Whooping cough	33
Measles	86		

COSTA RICA

Antituberculosis and venereal disease work.—Information received under date of October 28, 1927, shows that a campaign of cure and prevention of tuberculosis and venereal diseases has been ordered to be instituted in the principal cities of Costa Rica. The campaign against tuberculosis is to be carried out mainly through visiting nurses and dispensaries are to be instituted for the free treatment of venereal diseases in the larger cities and free service by municipal doctors is to be provided in the smaller communities.

Campaign for extermination of rats—Limon and Puntarenas.—Information under date of December 16, 1927, shows that a campaign of rat extermination has been ordered into effect at Limon and Puntarenas, Costa Rico, as the result of action taken at the Pan American sanitary conference held during the autumn of 1927 at Lima, Peru.

EGYPT

Plague—December 29, 1927-January 8, 1928—Alexandria.—A fatal case of plague was reported December 29, 1927. The case occurred in an Egyptian workman employed in a cotton depot, who was found dead in his lodging, 850 meters from the port. *Suez.*—On January 8, 1928, a fatal case occurred in a native found dead in his lodging. The focus of this case was stated to be in the vicinity of a Government primary school 3½ kilometers from the port.

Summary and comparison with year 1926.—During the year ended December 31, 1927, 79 cases of plague were reported in Egypt, as compared with 150 cases reported during the corresponding period of the year 1926.

GUATEMALA

Sanitation along railway lines.—According to information received under date of November 29, 1927, sanitary work in towns on the railway connecting Guatemala City with Puerto Barrios, Guatemala, was done in October, 1927. The measures taken included oiling of stagnant water along the railway lines.

HONDURAS

Tegucigalpa—Malaria.—Cases of malaria apparently of local origin were reported at Tegucigalpa, Honduras, during the month of September, 1927. A survey showed mosquitoes breeding in two localities along the Choluteca River banks within the city limits. It was stated that measures were being applied to correct these conditions.

JAPAN

Dysentery—Tokyo, city and prefecture—November 27–December 31, 1927.—During the period November 27 to December 31, 1927, dysentery was reported in Tokyo, Japan, as follows: Tokyo City, cases, 110; deaths, 50; Tokyo prefecture, outside of the city, cases, 144; deaths, 70.

LATVIA

Communicable diseases—November, 1927.—During the month of November, 1927, communicable diseases were reported in the Republic of Latvia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	6	Puerperal fever	5
Diphtheria	28	Relapsing fever	2
Erysipelas	8	Scarlet fever	155
Influenza	22	Tetanus	1
Malaria	3	Trachoma	16
Measles	217	Typhoid fever	87
Mumps	7	Whooping cough	15

Population, 1,950,000.

MEXICO

Manzanillo—Death from smallpox—General vaccination ordered—January 19, 1928.—Information received under date of January 19, 1928, shows that, following the occurrence of a death from smallpox during the week ended January 15, 1928, at Manzanillo, Mexico, the port medical authority has directed all local physicians at Manzanillo to assign one hour daily to the free vaccination of residents of Manzanillo, who are required to present certificates of vaccination to the medical authority.

PANAMA

Aguadulce, Province of Cocle—Antimalaria measures.—Information dated November 12, 1927, shows antimalaria work being conducted at Aguadulce, Republic of Panama. The work undertaken included control of water supply and sewerage and drainage systems.

PERU

La Oroya—Influenza and pneumonia mortality—October-December, 1927.—During the three months ended December 31, 1927, epidemic influenza in mild form was reported present at La Oroya, Peru. Many deaths from pneumonia occurred. Smallpox was said to be prevalent.

UNION OF SOUTH AFRICA

Typhus fever—December 18-24, 1927.—During the week ended December 24, 1927, fresh outbreaks of typhus fever were reported in the Cape Province, in two districts and five localities, and in Natal in one district.

During the same period, two cases of typhus fever were reported at Durban, Natal, in a European and an Asiatic. The cases were stated to be sporadic.

YUGOSLAVIA

Communicable diseases—December, 1927.—During the month of December, 1927, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	36	1	Poliomyelitis	2	
Cerebrospinal meningitis	9	4	Scarlet fever	1,691	244
Diphtheria	303	51	Tetanus	11	7
Dysentery	49	5	Typhoid fever	466	69
Leprosy		1	Typhus fever	1	
Measles	3,301	18			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept 24, 1927	Sept 25-Oct. 22, 1927	Week ended— Oct 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7
China:																
Amoy	C	2	28	72	16											
	D		7	3												
Canton	C	8	31	36	14	5	1	6			1					
	D	5	16	25	14	5	1	5			1					
Foochow	C	P	P	P	P											
Hong Kong	C	2	P	1	P											
	D	1														
Shanghai—(settlement and concession)																
Foreigners only	C		1	6	3											
Including natives	D		20	74	7											
Swatow	C	72	42	P	P	P	P									
	D	1		P	P	P	P									
Tientsin	C	P	P	15	2	P	P									
Dutch East Indies: Java—Batavia	C						1	2	25	2	1					
	D						1	2	15	2	1					
India	C	46,137	45,163	31,390	20,160	5,303	4,845	5,987	6,912							
	D	24,081	22,051	15,895	10,371	2,867	2,641	3,350	4,005							
Bombay	C	75	42	3				2								
	D	35	30	2				2								
Calcutta	C	95	87	76	101	28	35	65	71	156	119	87	66			
	D	48	40	39	64	22	25	42	49	106	77	55	43	48	34	27
Madras	C	424	547	59	14			6	7			1				
	D	204	278	48	8			3	4	1		1				
Rangoon	C	2	1	2	6		1		1	3	1	2	2	1		
	D	2	1	2	5	1		3	4	2	1	2	1	1	1	
Tuticorin	C				1						6		2			
	D				1	7	5	10	15		6	6	2			
India (French):																
Karikal	C	56	18	1			1									
	D	45	12	1			1									
Pondicherry	C	37	12	15			1				5					
	D	24	11	15			1				5					

Place																
	D															1
Iraq:[1]																
Amarah	C					4	8	3	2		1	1				
	D					6	8	3	2		1	1				
Baghdad	C						10	13	8	3	38	6		3		
	D						5	2	2	3	38	6				
Diwaniyah	C					4	3	1	2							
	D					2			1							
Diyala	C										1					
	D										1					
Dulaim	C										1					
Hillah	C					7	3	5	53		7					
	D					6	2	1	29		4					
Kerbala	C					1	4	2	2							
	D					1	5	2	2							
Kut	C					9	1	5								
	D					4	1	3								
Montafiq	C							4	14		8					
	D							2	10		8					
Ramadi	C					19	18	27	21							
	D					10	23	14	16		1					
Japan: Yokohoma	C	1														
	D	1														
Philippine Islands: Manila	C	1	1													
Siam	C	81	77	40	18	14	23	43	30	19	29	18	32			
	D	59	53	24	11	10	15	25	26	11	19	13	21			
Bangkok	C	6	2	3	5		1		3		1	1	1	2	3	7
	D	1	1	1	3		1		1		1		1	2	1	3
Straits Settlements: Singapore	C					1		4	2	1	2		2	3	12	3
	D					1		4		2			2	1	3	5
On vessel:																
S. S. Adrastus: At Yokohoma, Japan	C		1													
	D		1													
S. S. Tabaristan: At Basra, Iraq	C				1											

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927		
						1-10	11-20	21-30	1-10	11-20	21-31
Indo-China (French):											
Annam	C	911	1,628	640	226	13	75	38	16	2	
Cambodia	C	87	89	75	180	56	1	23	21	12	39
Cochin-China	C	257	68	144	178	21	27	52	17	38	58
Laos	C	20	190	36	67	10					
Tonkin	C	1,093	180	24	1			1			2

[1] From July 24 to Oct. 22, 1927, 926 cases and 677 deaths were reported in Iraq. Of these, 166 cases and 126 deaths occurred in Amarah; 417 cases and 337 deaths in Basra; 81 cases and 47 deaths in Diwaniyah; 19 cases and 12 deaths in Hillah; 34 cases and 21 deaths in Kerbala; 8 cases and 6 deaths in Kut; and 185 cases and 118 deaths in Montafiq.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases: D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended: Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21
Algeria: Oran	C		4	1			1		1									
	D		3	1														
Arabia: Aden	C																24	13
	D																9	8
Argentina:																		
Bahia Blanca District	C									1	1	1						
Buenos Aires [1]	D																	
Cordoba Province	C		2		P	P	P			10				1	1			
Entre Rios	C		5															
Firmat	C												1					
Quilino	C									1	1	1						
Rosario [2]	C									1	1	1	1	2	3			
Ucacha	C												1					
Azores: St. Michaels Island	C	2	2	2	3	1		1	1	1	1	1		1		1		
	D			1	1							1						
Brazil: Rio de Janeiro	D																	2
British East Africa:																		
Tanganyiki	C	P	P		P	P	P											
Uganda	C	528	456	226	99													
	D	413	345	158	88													
Canary Islands:																		
Las Palmas	C				9					1			2			2		
Santa Cruz	C																	1
Ceylon; Colombo	C		1	3	1					1	1					1		
	D			3												1		
China:																		
Amoy	C	P																
Tungliao	D				200													
Tientsin	C		2															
Dutch East Indies:																		
Java	D			432	779	191	213											
Batavia and West Java	C	40	71	68	130	41	29	31	34	45	43	32						
	D	40	71	68	129	41	29	31	34	44	43	32						
Cheribon	C										1							
	D										1							

East Java and Madura	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]							
	D	29	27	18	17	3	4	2	1	5	3							
Balik-Papan	C													1				
	D													1				
Makassar	C						2	2	2	1		1		2	1			
	D						2	2	2	1		1		2	1			
Egypt:																		
Alexandria	C		2	1						5	3	2	2	3	2			
	D									5	3			1	1			
Suez	C			1													1	
Greece:																		
Athens and Piraeus	C		1	3	1										2	1		
	D				1										1			
Mitylene	C		1	5	1	1		2		1	1	1						
Patras	C		2	2	1		1											
	D				1		1											
Hawaii Territory: Hawaii	D		1															
India	C	404	1,391	2,710	3,246	812	1,015	856	919	1,193								
	D	241	836	1,428	1,792	495	551	485	554	668								
Bombay	C	14	14	7	4										1			
	D	13	11	5	3										1			
Calcutta	C			18														
	D			10														
Madras Presidency	C	255	620	465	583	149	83	152	86	190	158	220	223					
	D	115	321	230	298	63	54	80	85	111	61	108	79					
Rangoon	C	21	15	6	11	5	2		4	5	2	6	2	2				
	D	20	14	6	11	5	2		4	5	2	5	3	2	3			
Indo-China: Saigon	C			2					1									
Senegal:																		
Baol	C	41	23	72	95				P		P							
	D	22	13	33	40													
Cayor	C	126	227	463	176	32	8	8	P									
	D	74	166	233	88	20	4	4										
Dakar	C	67	46	20	1													
	D	41	32	12														
Louga	C			5	8													
	D			4														
M'Bour	C	28																
	D	23																
Rufisque	C	104	44	16														
	D	82	38															
Thies	C	7		9	1	1												
	D	3		7														
Tivaouane	C	43																
	D	29																
Siam	C				13					2			1					
	D				9		1			1			1					
Bangkok	C				2													
	D						1											

[1] A death from plague was reported at Buenos Aires, Argentina, Feb. 9, 1928. Unconfirmed newspaper reports announced 4 other deaths from plague.
[2] Four cases of plague Jan. 15-25, 1928, at Rosario, Argentina.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases, D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug 28-Sept 24, 1927	Sept 25-Oct 22, 1927	Week ended— Oct 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21
Straits Settlements: Singapore	C								1									
	D								1									
Turkey: Constantinople	C			1	1					1	1							
	D				1						1							
Union of South Africa: Cape Province	C					2						2						
	D					2						1						
Orange Free State	C	4							1	8	P							
	D	4							1	6								
U. S. S. R.: Chita District	C				1													
	D				1													
Northern Caucasus	C			14	1													
	D			10														
On vessel: At La Plata, from Rosario, Argentina	C														1			
S. S. Aghios Gerasimos at Vigo, Spain	C								3									

Place		July	August	September	October	November	December
Algeria: Algiers	C				2		
British East Africa: Kenya	C	13	61	21	13	28	
Ecuador: Guayaquil	C	5	7	3	4	9	5
	D					3	2
Indo-China (French)	C			14	3	3	
Madagascar	C	46	98	170	166		
	D	43	89	154	155		
Ambositra Province	C	6	1		6		
	D	6	1		6		
Antisirabe Province	C		34	5	19		
	D		34	4	19		
Itasy Province	C	14	11	21	16		
	D	14	7	20	15		
Madagascar—Continued. Moramanga Province	C	5	4	3	24		
	D	5	4	3	20		
Tananarive Province	C	21	48	142	99		
	D	19	43	127	93		
Mauritius	C			1			
Peru	C	8	11	15	14		14
	D	7	6	6	5		4
Callao	D	3					
Lima	D				1	1	1
Syria: Beirut	C			1	1		

Indo-China (French), 3 cases, Dec. 11-20; Beirut, Syria, 1 case, Dec. 1-10.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28
Algeria	C			382	683		294	218	149										
Algiers	C												3	3	4				
Oran	C	14	9	16	11		10	4	6	9	11	10	9	8	15	2			
Arabia: Aden	C	2							1		1		1						
	D	1																	
Brazil:																			
Para	C		1																
Rio de Janeiro	C	4	6	10		1													
	D	4	4	9		1													
British East Africa: Tanganyiki	D		21	8	P	P	P												
British South Africa:																			
Northern Rhodesia	C	48	55	39	164	150	10	22	3	57	15	125	55	2					
	D	2	1	2	11	40	23		1	18	7	28	9						
Southern Rhodesia	C								3				2	1					
Canada:																			
Alberta	C	42	17	17	23	6	2	1	1	7	3	3	6		3	3	5	1	19
Calgary	C	5	1																
Edmonton	C				1	1				6		1	1			3	2	1	
British Columbia: Vancouver	C			2								4		1	3	3	1		
Manitoba	C		13	9	7	3	14		2	1	3	1	2	2	2	2	5		1
Winnipeg	C	3	5	4	2				2			1	1	1			1	1	1
New Brunswick	C			2										1					
Nova Scotia	C			1	1														
Halifax	C				1														
Ontario	C	63	60	22	96	64	38	77	85	71	90	82	104		53	83	76	52	77
Hamilton	C										2								
Kingston	C								1					1					
Ottawa	C	37	27	40	67	47	17	51	19	10	19		34	18	9	20	23	20	16
Toronto	C	5		2	10	2	16	3	13		25	14		7		11	10	8	5
Windsor	C				9														
Quebec	C	12	1		8	7	3	12	3	8	5	3		14	3	10	17	7	18
Montreal	C							1						1		1	6	3	4
Quebec	C										2		2		2		3		
Riviere du Loup	C								3										
Saskatchewan	C	25	14	68	31	5	12	2	14	9	15	19	15	12	13	15	12	39	15
Moose Jaw	C		10	16	3								1		1	2	1	4	2
Regina	C	2	8		5			1											
Saskatoon	C											2			4				1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927				December, 1927					January, 1928			
							5	12	19	26	3	10	17	24	31	7	14	21	28
Ceylon: Colombo	C		1								1								
	D		1																
China:																			
Antung	C	3																	
Canton	C			1															
	D			1															
Chefoo	C			1	P					P									
	D			1															
Foochow	C	P	P	P	P		P			P									
Hong Kong	C	3	1	2															
	D	3	1	2															
Manchuria—																			
Changchun	C	4								1									
Dairen	C				1		2						1						
	D				1														
Fushun	C	1		1				1											
Harbin	C	1											2		1				
Mukden	C	3			2	1													
Pensihu	C	1			1														
Tientsin	C	11		4	13	8				4	1	2	2	2					
Dutch East Indies:																			
Batavia and West Java	C	2	4		4			25											
	D							15											
East Java and Madura	C	8	4	22	8	1	3	5		4	3	2							
	D				1														
Egypt	C	4		3							4								
	D			1	1							1							
Cairo	C										1								
Great Britain:																			
England and Wales	C	721	568	508	473	199	219	258	226	233	366	230	212	255	247	275	398		
Birmingham	C		1		1														
Bradford	C					1	5	3	2	9	6	2	2	2	2	4	24		
Bristol	C				6	1			3	2	4	2							
Cardiff	C					1										1			
Leeds	C	2	5	3	7	1	1	1	2	3	3	6	4	4	6	1			

Liverpool	C																1		
Manchester	C				3		1	1	4	2	5	10	8		1	2	2		
Newcastle-upon-Tyne	C	1	1	2	6	2	6		1	28	18	5	4	2	13	2	5		
Sheffield	C	11	2	1	10	4			2	1	8			3		1	10		
Stoke-on-Trent	C		1													3	1		
Greece: Salonika	D	1	2																
Guinea (French): Beyla	C	9																	
India	C	11,340	5,911	4,398	3,153	779	805	1,235	1,233										
	D	3,140	1,668	1,120	715	190	200	211	326										
Bombay	C	38	33	12	10	2			4				5		4				
	D	21	19	8	2	2			1				1						
Calcutta	C	93	27	22	5				5	4	3	11	7		17				
	D	70	25		6				2	2	1	6	2		17				
Madras	C	4	6	7	8	3		2	2	2	2	5	2	2					
	D	1		2		1		1		1	1	1		1					
Rangoon	C	37	14	9	17	4		1	1	5	2	1	6	36	28				
	D	11	3	2	3	1				1	1		2	5	13				
India (French):																			
Karikal	C	2	3	1	2		P												
	D	2	3	1	2														
Pondicherry	C	22	39	37	38														
	D	20	31	37	38														
Indo-China: Saigon	C	1	1	1									1		1				
Iraq:																			
Baghdad	C			1	7			5		1	5	7	12						
	D			1	4			4			5	4	5						
Basra	C	1	1	4	2				3		2	2			2				
	D	1	1	4	2				1		2	1			1				
Italy: Rome and vicinity	C	1		1															
Jamaica (outside Kingston) (alastrim)	C	15	6	9	9	7				1		1	1		2				
Kingston	C			3	2														
Japan: Nagasaki	C	17	2																
	D	5	1																
Mexico:																			
Acapulco	C			2				1											
	D			2				1											
Chihuahua	D															1			
Guadalajara	D									1			1						
Manzanillo	D																1		
Mexico City and surrounding territory	C									1	1	1	1						
Monterey	C	6																	
	D	4																	
San Luis Potosi	D	4	1																
Torreon	D		1		2														
Palestine: Jerusalem	C										1								
Paraguay	D	2																	
Persia: Teheran	D	2																	
Poland	C	7	2																
	D	2	1																

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3–30, 1927	July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927				December, 1927					January, 1928			
							5	12	19	26	3	10	17	24	31	7	14	21	28
Portugal:																			
Lisbon	C	4		3	8	1	2				1					4			
	D												1						
Oporto	C			1															
Siam	C	34	51	27	6				1		8		1						
	D	9	10	15									1						
Bangkok	C	5		3					1		1								
	D	1		1															
Spain:																			
Malaga	D								1	1									
Seville	C																1		
Valencia	C				1										1	1			
Straits Settlements: Singapore	C							1											
Sumatra: Medan	C		1										3						
	D												2						
Switzerland	C													2					
Tunisia: Tunis	C															2			
Union of South Africa:																			
Cape Province	C	P	P		P														
Orange Free State	C		P						P	P	P	P							
Transvaal	C				P	7													
Venezuela: Maracaibo	D	1		2	1														

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927		
						1-10	11-20	21-30	1-10	11-20	21-31
Algeria	C	376	459	382	682						
Oran	C	14	10	16	11						
Indo-China	C	19	3	21	25	13	3	22	10		
Syria:											
Aleppo	C										1
Beirut	C								1		1
Damascus	C		3	5	22		13		4	6	2

Place		July	August	September	October	November	December
Angola	C	42	2	5	73		
	D				2		
Congo	C			5	77		
Cuanza-Norte	C			1			
Cuanza-Sul	C				2		
Loanda	C			1			
Zaire	C			3	4	1	
Brazil: Porto Alegre	C	5	3	3	4		
British East Africa: Zanzibar	C				2		
	D				1		
Chosen	C	19	2				
	D	6					
Ecuador, Guayaquil	C		2	2	1	1	4
France	C	23	6	8	7	4	
Gold Coast	C	1	1	5			

Place		July	August	September	October	November	December
Greece	C	3	3	4	4		1
Latvia	C				2		
Mexico	D	93	73	55			
Morocco	C	53	76	51	81		
Nigeria	C	492	91	237			
	D	83	20	70			
Persia	D					2	
Spain. Madrid	D					1	
U. S. S. R.:							
Railways, etc	C	11	6				
Other territories in Europe	C	146	111				
Transcaucasus, Siberia, and Central Asia	C	36	29				
Ukraine	C	16	4				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14
Algeria: Oran	C													1	1		
Bulgaria: Sofia	C				17	3	1	2					1	1	4	1	
	D						1										
Chile:																	
Antofagasta	D	1			1												
Talcahuano	D	1															
Valparaiso	C	2		1				1		1	1						
	D		2	1				1	1								
China:																	
Manchuria—Harbin	C	3	2					1									
Tientsin	C	1		2													
Egypt	C	24	2		12		4			1	7	3		1			
	D	1	3		5						5	1					
Port Said	C				1						1						
Ireland (Irish Free State):																	
Cork County	C	1										3				1	
Donegal County, Letterkenny	C				4												
Mexico:																	
Guadalajara	D									1							
Mexico City, including municipalities in Federal District	C	16	17	19	18	9	6	2	11	7	6	4		4	4	4	3
	D						2						1	1	3	1	
Palestine:																	
Haifa	C		4		2				1	1							
Herzliah	C									1							
Jaffa	C		2		1					1							
Nazareth	C	1	2						1								
Safad	C	1	2							1		1					
Tel-Aviv	C		1	1	2				1	1	1						
Poland	C	99	50	35	19	35	12	6	11	13	28	17	35				
	D	10	6	2	4	6	3		2	1	5		4				
Portugal: Oporto	C		1			1								1			

Rumania	C	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]						
	D	4	1		2												
Syria: Aleppo	C			2												2	
Tunisia	C	29	14	1	3			1					1	1			
Union of South Africa:																	
Cape Province	C	P	P	P	P		P	P	P	P	P	P	P				
Natal	C	P	P	P	P		P	P	P	P	P	1	P				
Orange Free State	C	P			P							P					
Transvaal	C	18	1		5		P	P	P	P	P						

Place		1927				November, 1927			December, 1927		
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31
Algeria	C	67	33	10	12						
	D	13			1						
Algiers	C	2	2	6	2						
Bulgaria	C	12	24	7	2						
	D		1	2	1						
Morocco	C	148	76	7	11	5	14	7	5	6	75

Place		July	August	September	October	November	December
Argentina	C					1	
Chosen	C	72	17				
	D	8					
Chemulpo	C	1	2				
Gensan	C	2					
Seoul	C	2	3		2		
	D	1			1		
Czechoslovakia	C	6					
Greece: Athens	C	1		2			1
Japan	C	1					
Latvia	C	6					
Lithuania	C	44	18	7	9	18	
	D	5	8	1	1	1	

Place		July	August	September	October	November	December
Mexico	D	12	38	14			
Peru:							
Arequipa	D		2	1	2		
Lima	D	8					
U. S. S. R.:							
Railways, etc.	C	30	22				
Transcaucasus, Siberia, and Central Asia	C	79	69				
Ukraine	C	96	85				
Other territories in Europe	C	732	552				
Yugoslavia	C	11	9		1	1	
	D	4	1				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	Jan. 7, 1928
Belgian Kongo: Boma and Matadi	C														7	
Ashanti: Obuasi	C		1													
	D		1													
Dahomey:																
Grand Popo	C									1						
	D									1						
Porto Novo	C	1														
	D	1														
Ivory Coast	C	1												1		
	D	1												1		
Liberia: Monrovia	C			1												
Nigeria	C			2												
	D			2												
Senegal	C	3	10	21	31	9	16	6	7							
	D	3	9	21	31	8	10	4	6							
Dakar	C	1			12	3	6		5	2	1	4			1	1
	D				7	2	4		4	2	1	4			1	1
Geoul	C				1											
	D				1											
Goree Island	C			2												
	D			2												
Kebemer	C				2											
	D				2											
Kelle	C				2	1										
	D				1	1										
Keur Samba Kane	C					1	1									
	D						1									
Keur Madiop	C					1										
	D					1										
Khombole	C		3		3				1							
	D				3				1							
Louga	C				1	2	1	1								
	D				1	2	1	1								

[illegible]	C				1	1	2	2								
	D					1	1	1								
M'Dande	C				1		2	1								
	D				1		1									
Ouakham	C	2	2													
	D		1													
Pout	C			1												
	D			1												
Rufisque	C				1											
	D				1											
Saint Louis	C		2		1											
	D		2		1											
Sebikotane	C				1		2	1								
	D				1			1								
Thies	C	1		3	8	1	2	1	1							
	D	1		3	8	1	2	1	1							
Tiaroye	C			1												
	D			1												
Tivaouane	C			1												
Togoland	C		1													
	D		1													

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

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FEBRUARY 24 - - 1928

SPECIAL ARTICLES

Prevalence of Influenza During January, 1928
Trachoma Prevention in the State's Health Program
An Epidemiological Study of Tonsillitis
National Negro Health Week, April 1 to 8, 1928

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R. C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 43 FEBRUARY 24, 1928 NO. 8

PREVALENCE OF INFLUENZA, JANUARY 1 TO FEBRUARY 4, 1928

Preliminary reports from the health officers of 31 States for the first five weeks of 1928 indicate that the prevalence of influenza was about the same as it was during the same period of 1927, and about half that for 1926. The figures are as follows:

Cases of influenza reported by 31 States (population about 66,500,000) for the first five weeks of 1926, 1927 and 1928

Week ended—	Corresponding weeks—		
	1928	1927	1926
Jan. 7, 1928	1,230	1,120	1,663
Jan. 14, 1928	1,456	1,657	2,274
Jan. 21, 1928	1,651	1,594	3,114
Jan. 28, 1928	1,546	1,767	4,703
Feb. 4, 1928	1,869	1,560	4,942
Total	7,752	7,698	16,696

In 1926 and 1927 the peak of the influenza curve was reached early in March.

Comparable figures for the year 1925 are not available for some of the States, but the prevalence of influenza during the first five weeks of the year was greater in 1925 than it was in 1926, although in 1925 the peak of the influenza curve was reached about the middle of February and the total number of cases reported for January, February, and March was lower than it was in 1926.

The combined influenza and pneumonia death rates per 100,000 population in 94 large cities of the United States for the first five weeks of the years 1926, 1927, and 1928 were as follows:

	Death rate
1926	233
1927	198
1928	192

TRACHOMA IN THE STATE'S HEALTH PROGRAM[1]

By Paul D. Mossman, *Surgeon, United States Public Health Service*

The organized trachoma prevention work of the United States Public Health Service, in cooperation with States, began with the extensive survey made in eastern Kentucky in 1912 by Senior Surg.

[1] Read before the Public Health Section of the Southern Medical Association, Memphis, Tenn., Nov. 16, 1927.

John McMullen. This survey, made in response to a request from the Kentucky State Health Department, showed that trachoma was extremely prevalent and confirmed the statements of Dr. J. A. Stuckey and others that trachoma constituted a major public health problem in eastern Kentucky. The scope of Doctor McMullen's survey was enlarged in 1913 and 1914 to the extent of covering some 23 counties and involving the examination of over 18,000 people. On the basis of these examinations Doctor McMullen estimated that in the 35 mountain counties of Kentucky there were about 33,000 cases of trachoma. Being charged with the task of preventing the spread of trachoma, he evolved a plan which has not only stood the test of time, but has won the approval and praise of public health workers in many countries. The plan included the establishment of small hospitals which should serve not only as dispensaries and clinic centers, but as centers for field work in the form of surveys, field clinics, and educational work. The first hospitals were established in September, 1913, in Kentucky. In 1914, one was established in Virginia, following surveys by Senior Surg. Taliaferro Clark, of the United States Public Health Service, which showed that trachoma was quite prevalent in the western section of that State. Then the work spread to West Virginia, Tennessee, and, later, to Arkansas and Missouri, as the work became known and studies showed the prevalence of the disease in those States. Evidence which has accumulated as the work has progressed indicates that Missouri and Arkansas probably have as much trachoma as Kentucky had when the work began, and that it exists to a dangerous extent in several other States. It is not uniformly prevalent throughout any State; some communities are heavily infected while others are relatively or completely free from it.

At present, hospitals are being conducted in Kentucky, Tennessee, Arkansas, and Missouri, with the financial and moral cooperation of those States. The trachoma situation in Missouri began to attract attention through the action of the blind pension law which became effective in 1922, providing $300 per year for blind persons without other means of support. It was found that over 20 per cent of these pensioners were blind as a result of trachoma. This made blindness due to trachoma cost the taxpayers of the State over $200,000 annually in pensions alone, to say nothing of the economic cost in medical treatment, and the loss due to the withdrawal of these disabled persons from productive toil. Although new applicants have been added to the pension list and all the pensioners have been reexamined by very competent ophthalmologists, the percentage of cases of blindness due to trachoma has changed very little and has never dropped below 20 per cent. The latest figures (July 7, 1927) show a total of 3,152 pensioners, and of these, 637, or 20.2 per cent,

were blind from trachoma, costing the State in pensions $191,100 each year. These pensioners are completely blind, having no better vision than mere light perception. Many more have enough vision to be excluded from the provisions of this law, but not enough to enable them to earn a livelihood. Damage to vision sufficient to prevent education or the learning of a skilled trade is sufficient to depress the economic and social status of the individual and often of the family. Trachoma is thus a link in the vicious cycle of ignorance, poverty, and disease, each at once the result and the cause of the others.

The influence of the trachoma work on community interest in public health may be illustrated by the fact that Knott County, Ky., where our first hospital was located, was years ahead of many richer counties in installing a county health department. It is generally admitted that the value of public health work in that county was first shown to the people of the county by the teaching given by the hospital staff, both at the hospital and in the field. One of the first sanitary privies in the county was the one built at the hospital.

In many other localities the trachoma work has given the people their first view of public-health work of any sort and their first idea of the possibility of disease prevention. It is easier for State health authorities to persuade a county to install a full-time health department if energetic trachoma work has been done in that county. Conversely, it is possible for us to do much more effective trachoma-prevention work when we have the assistance of a well-organized county health department, especially when the State health department is manifesting an active interest in the campaign.

In introducing a specialized method of combating a single disease, the Public Health Service has not detracted in any way from the effectiveness of the regular health agencies within the State. We have utilized the services of State and county health authorities in carrying out our field work and in return they have had the services of our organization trained especially for the work, but with a public health vision broad enough to see the whole health program with trachoma prevention a component part, contributing to the success of the whole in proportion to its effectiveness in its own field.

The trachoma hospitals have a fourfold function, as follows:

1. Clinical treatment of trachoma for the purpose of preventing damage to sight and of stopping the patient from being a spreader of the disease. Field surveys have shown that the results of treatment have been good in a large majority of cases, the patients having remained free from evidence of the disease for a number of years. It has also been shown by the resurvey in Knott County, Ky., by Doctor McMullen, of the Public Health Service, and Doctor Duke, county health officer, and by field studies in several other localities,

that an intensive trachoma campaign can rid a community of the disease.

2. Study of the disease itself. We are constantly on the alert for improved methods of diagnosis and treatment. Although nothing revolutionary has been discovered, we believe that we have made substantial improvements both in accuracy of diagnosis and in effectiveness of treatment. In connection with our work at Rolla, Mo., the service is maintaining a research laboratory for the study of the etiology of trachoma from a bacteriologic standpoint. We also have an officer making an extended epidemiological study of the disease.

3. Education of patients in personal hygiene and disease prevention. Patients admitted to these hospitals receive careful treatment for trachoma and also instruction in personal hygiene, health, habits and general health education. They are enabled to go home relieved of their disease and trained to some extent at least to live in a clean, health-promoting manner.

4. Centers for field work. Trachoma surveys are made in the surrounding territory by the staffs of the hospitals, by means of examination of school children, and by community clinics. In the course of these surveys and clinics, talks are given on general health topics as well as on trachoma in particular. The chief value of the clinic, so far as trachoma is concerned, is the contact with the patient himself—establishing the diagnosis and showing him the value and importance of early treatment as well as the danger of spreading the disease to others.

During the past four months we have had a public health nurse on duty in Texas County, Mo., engaged in special field work. She was provided with a list of the Texas County residents who had been treated at the hospital. Her task was to look them up and report on their condition and also as to their home surroundings, diet, and other factors that might have a bearing on the incidence or spread of the disease. She also discovered suspicious eye trouble in other members of these households and in other homes in the community. These people were persuaded to come to the clinics which were held at Houston, the county seat, every Saturday. The clinics were conducted by a medical officer from the Public Health Service headquarters at Rolla, and the diagnosis of the cases sent in by the nurse was thus verified. Seventeen such clinics were held, with an average attendance of 95. Some patients came repeatedly for treatment or observation. The nurse made careful records of 254 persons during the summer. Of these, 230 were new patients who had never been in our hospital, and most of them had had no systematic treatment at all. As a result of this work a popular demand for a county nurse has arisen, and the county court will undoubtedly decide to

appoint a full-time county nurse half of whose salary will be paid by the State health department, and it is not too much to hope that another season's work may help in getting a full-time health officer for the county.

We have a somewhat similar study now going on in eastern Tennessee, which will require many months to complete, but which has already shown that in certain counties trachoma is apparently about to become a thing of the past as a result of the work done in that part of the State during the past 11 years.

No one realizes better than those of us who are in the work how far from perfect it is both in organization and execution. The chronicity of the disease, the time required to arrest it, the lack of hospitals large enough to be conducted economically, the ignorance of the people, the sad home conditions they return to when they leave the hospital—these and many other conditions make up the list of problems we must continually face. The work does have an appeal to the public, however, and legislators are not immune to this appeal when they are made acquainted with the prevalence of the disease in their State and the effectiveness of the cooperative campaign of the State health department and the United States Public Health Service.

AN EPIDEMIOLOGICAL AND STATISTICAL STUDY OF TONSILLITIS, INCLUDING RELATED THROAT CONDITIONS

In view of the widespread attention which has been given in recent years to tonsil defects and their remedy by tonsillectomy, it was deemed worth while for the Public Health Service to make a study of acute and chronic diseases of the tonsils and throat. Public Health Bulletin No. 175, by Selwyn D. Collins, associate statistician, United States Public Health Service, gives the results of this study.[1]

The data used consist of (*a*) records of sickness occurring in several groups of people kept under observation for illness for several years, and (*b*) results of physical examinations made by medical officers of the United States Public Health Service in the course of various field studies conducted during the past 10 years. The bulletin considers acute tonsillitis and sore throat, enlarged and diseased tonsils as found on physical examination, and the relation of the condition of the tonsils to illness and to physical defects. Mortality from diseases of the tonsils and pharynx is also briefly considered.

Some of the outstanding results are summarized below:

The incidence of tonsillitis and related conditions of the pharynx is higher among children of school ages than before or after those ages.

[1] This bulletin may be purchased through the Superintendent of Documents, Government Printing Office, Washington, D. C., at 30 cents per copy.

Laryngitis, on the other hand, appears to occur more frequently among adults than among preschool or school children. Tonsillitis and related conditions of the pharynx appear to be the only important respiratory affection which shows this particular age incidence; that is, higher during the school ages than among younger or older persons.

The incidence of tonsillitis and related conditions of the pharynx appears to be considerably higher for females than for males.

The relative age incidence of acute tonsillitis and sore throat is strikingly similar to the relative age prevalence of diseased tonsils as found on physical examination. The relative prevalence of enlarged tonsils as found on physical examination is also similar to the relative age incidence of acute tonsillitis and sore throat, but does not show as close correspondence as the curve for diseased tonsils.

The prevalence of defective tonsils does not seem to be significantly greater in rural than in urban districts. The percentage having had the tonsils removed, however, was considerably larger in the urban groups examined than in the rural.

The prevalence of defective tonsils seems to vary somewhat with the season of the year, but the variation is less than is the variation in the incidence of acute tonsillitis and sore throat. The maximum prevalence of defective tonsils appears to be reached about April, a period of two or three months after the maximum incidence of acute tonsillitis and sore throat and of colds.

The incidence of sore throat seems to be more than twice as great for school children with defective tonsils as for those whose tonsils have been removed. The incidence of sore throat among children with normal tonsils also appears to be less than among those with defective tonsils.

Respiratory diseases other than tonsillitis appear to be somewhat more frequent among children with defective tonsils than among those with normal tonsils or those whose tonsils have been removed. Among adults there seems to be little difference in the incidence of these respiratory diseases in the different tonsil groups.

The incidence of illness from rheumatism and related conditions appears to be higher among adults who have attacks of tonsillitis than among those who are free from tonsillitis.

The incidence of diphtheria seems to be much higher among children with defective tonsils than among children with tonsils removed. Among children with normal tonsils it appears to be only slightly higher than among those whose tonsils have been removed.

The results of the physical examination suggest that adenoids, enlarged cervical glands, conjunctivitis, eyestrain, and decayed teeth

all tend to be slightly more prevalent among children with defective tonsils than among children with normal tonsils or with tonsils removed.

Filled teeth are more prevalent among children with tonsils removed, indicating that these children are a somewhat selected group, coming from families that are more able or willing to secure the correction of other remediable physical defects in their children.

Height and weight measurements and records of growth in weight over a period of nine months for a group of school children did not show any advantage in the growth of one tonsil group over another. Data from the literature seem to indicate a more rapid growth immediately .tonsillectomy, but this tendency does not appear to continue for any extended period of time.

DEATH RATES IN A GROUP OF INSURED PERSONS

RATES FOR PRINCIPAL CAUSES OF DEATH FOR DECEMBER, 1927, AND FOR THE YEARS 1911, AND 1917 TO 1927

The accompanying tables are taken from the Statistical Bulletin for January, 1928, issued by the Metropolitan Life Insurance Co. They present the mortality experience of the industrial insurance department of the company for the principal causes of death for December, 1927, and a comparison of the rates for the years 1911 and 1917 to 1927, inclusive. The rates are based on a strength of approximately 18,000,000 insured persons of the United States and Canada. In recent years the death rates in this group have been about 72 per cent of the rates for the death registration area of the United States.

DECEMBER, 1927

The month of December, 1927, as was the case with five other months of the year, registered a lower death rate than had ever before been recorded for the corresponding month of any year. The death rate for December was 8.7 per 1,000, as compared with the previous low rate of 8.9 for December, 1925.

While the rate for almost every cause of death listed in the accompanying table is lower than that registered last year, the most important single factor in the low December death rate is stated to be the low mortality, for a winter month, from pneumonia. Other noteworthy reductions were those for tuberculosis, cancer, and Bright's disease.

There were more automobile fatalities than in December, 1926, and this was the tenth month of the year 1927 to record an increase in such deaths over the corresponding month of last year.

Death rates (annual basis) for principal causes per 100,000 lives exposed, December, 1927, as compared with November, 1927, and December and year 1926

[Industrial department, Metropolitan Life Insurance Co.]

Cause of death	Rate per 100,000 lives exposed [1]			
	Dec., 1927	Nov., 1927	Dec., 1926	Year 1926
Total, all causes	866.0	849.8	932.5	945.6
Typhoid fever	2.8	4.3	4.1	4.2
Measles	2.0	1.0	3.3	10.2
Scarlet fever	2.5	2.6	2.4	3.4
Whooping cough	3.7	3.9	5.8	9.6
Diphtheria	14.3	12.4	15.5	9.7
Influenza	17.7	11.0	18.7	31.1
Tuberculosis (all forms)	84.0	79.2	89.7	99.0
Tuberculosis of respiratory system	74.1	70.3	80.1	86.7
Cancer	73.0	73.5	78.4	73.7
Diabetes mellitus	18.1	16.2	20.2	16.7
Cerebral hemorrhage	56.0	53.2	54.7	55.6
Organic diseases of heart	135.3	133.2	139.7	134.3
Pneumonia (all forms)	83.5	66.0	97.4	98.2
Other respiratory diseases	16.4	14.9	15.2	13.0
Diarrhea and enteritis	16.1	23.1	17.4	29.8
Bright's disease (chronic nephritis)	65.7	66.7	78.0	73.5
Puerperal state	12.3	14.5	12.8	15.3
Suicides	7.2	8.0	7.4	7.7
Homicides	6.6	7.6	7.3	7.0
Other external causes (excluding suicides and homicides)	59.9	62.4	62.2	62.3
Traumatism by automobiles	16.5	20.8	14.3	16.8
All other causes	180.0	194.2	202.3	191.0

[1] All figures include infants insured under 1 year of age.

YEAR 1927 AND COMPARISON WITH 1911 AND YEARS 1917 TO 1926

In 1927 a new low minimum death rate of 8.4 per 1,000 was established for this group of persons, which comprises one-seventh of the total and more than one-fourth of the urban populations of the United States and Canada. This favorable health condition probably obtained in, and will no doubt be reflected in the death rates for, the registration area. The previous low rate for this group was 8.5 per 1,000 for the years 1924 and 1925, and the next lowest was 8.9 in 1926. The importance of these fractional reductions is much more obvious when they are translated into figures showing the actual savings of lives. If the 1926 death rate had prevailed in 1927 there would have been 8,808 more deaths than actually occurred in the group of persons here considered, and the reduction of one-tenth of one point from the 1925 death rate represents 1,782 fewer deaths.

A new low death rate was recorded for tuberculosis, 93.5 per 100,000. This may be compared with the previous minimum rate of 98.2 in 1925, with 137.9 in 1920, with 189.0 in 1918, and with 224.6 in 1911. Improved conditions as compared with 1926 were shown also for measles, scarlet fever, whooping cough, pneumonia, influenza, diarrhea and enteritis, and the principal degenerative diseases.

On the other hand, the cancer rate was slightly higher, the diabetes rate and the rate for puerperal diseases were the same as in 1926, and the rate for automobile fatalities rose from 17 to 18.6, an increase

of 9.4 per cent over the preceding year. The 1927 figure for automobile fatalities is almost twice that for 1917, more than three times the rate for 1915, and more than eight times the rate for 1911.

Death rates for principal causes per 100,000 lives exposed, 1911 and 1917 to 1927, ages 1 and over

[Industrial department, Metropolitan Life Insurance Co.]

Cause of death	1927	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1911
All causes of death	839.9	885.7	846.3	848.0	897.1	882.9	870.6	989.4	1063.0	1559.2	1161.1	1253.0
Typhoid fever	4.7	4.2	4.6	4.4	5.2	5.7	6.7	6.7	7.3	11.5	12.1	22.8
Communicable diseases of childhood	19.6	25.9	19.7	26.2	33.1	29.8	37.9	43.1	31.5	41.6	46.8	58.9
Measles	3.3	8.0	2.5	5.7	8.4	4.3	3.2	8.5	3.5	8.6	11.1	11.4
Scarlet fever	3.0	3.4	3.4	4.3	4.4	4.0	7.0	6.0	3.9	3.6	6.0	13.1
Whooping cough	3.1	5.0	3.6	3.5	4.8	2.6	3.9	6.6	3.2	10.1	5.1	7.1
Diphtheria	10.2	9.5	10.2	12.7	15.5	18.0	23.8	22.1	20.9	19.3	24.6	27.3
Influenza and pneumonia	78.5	105.6	88.3	84.4	107.7	95.3	76.5	159.5	214.1	542.2	135.4	131.2
Influenza	15.6	27.4	19.4	14.2	30.1	21.7	8.7	53.5	96.9	272.4	14.4	15.9
Pneumonia	62.9	78.2	69.0	70.2	77.6	73.7	67.8	106.1	117.2	269.8	121.0	115.3
Poliomyelitis	2.0	.7	1.4	1.0	.7	.9	1.7	1.0	.6	1.1	1.6	1.6
Tuberculosis (all forms)	93.5	99.5	98.2	104.4	110.5	114.2	117.4	137.9	156.5	189.0	188.9	224.6
Tuberculosis of respiratory system	82.7	87.9	87.0	93.4	100.6	103.6	105.6	124.0	141.6	171.2	172.3	203.0
Cancer (all forms)	75.3	75.1	71.8	71.5	72.7	72.0	71.7	69.8	67.0	67.2	70.9	68.0
Diabetes mellitus	17.0	17.0	15.5	15.1	16.2	17.2	15.5	14.1	13.4	14.0	15.3	13.3
Alcoholism	3.4	3.7	3.0	2.9	3.0	2.1	.9	.6	1.4	1.8	4.9	4.0
Cerebral hemorrhage, apoplexy	55.7	56.5	54.4	61.1	61.9	62.9	62.1	61.3	59.8	64.0	66.8	64.2
Diseases of heart	134.3	136.4	128.7	125.2	128.7	126.7	117.4	117.0	113.9	141.7	142.0	141.8
Diarrhea and enteritis	9.1	10.5	12.3	11.3	11.1	10.8	14.2	15.8	16.9	23.4	25.5	28.0
Chronic nephritis (Bright's disease)	70.5	74.9	71.2	66.5	69.6	70.3	68.0	70.8	73.5	86.8	95.7	95.0
Puerperal state, total	15.6	15.6	16.9	17.2	17.9	19.0	19.8	23.0	20.0	27.4	18.2	19.8
Puerperal septicemia	6.3	6.0	6.6	6.6	6.9	7.4	8.5	8.6	6.7	7.3	7.5	8.8
Puerperal albuminuria and convulsions	3.1	3.6	3.8	4.3	4.2	4.7	4.9	5.0	4.8	4.9	5.1	4.7
Accidents of pregnancy	1.8	1.7	1.6	1.6	1.8	1.7	1.6	3.1	3.0	6.9	1.6	1.7
Total external causes	79.6	77.2	78.3	76.9	77.8	71.8	72.0	72.0	94.2	128.9	106.7	97.9
Suicides	8.4	7.8	7.0	7.3	7.4	7.5	7.6	[illegible]	6.8	7.0	9.3	13.3
Homicides	7.3	7.2	7.4	7.2	7.3	6.3	6.7	5.8	6.9	6.2	7.4	7.2
Accidents, total	63.8	62.3	63.9	62.4	63.0	58.0	57.5	59.6	63.8	75.5	76.5	77.4
Accidental burns	5.3	6.1	6.1	6.4	6.3	6.1	6.6	8.1	8.1	9.0	8.9	8.8
Accidental drowning	6.8	6.3	6.5	7.3	6.7	7.3	8.2	6.7	8.6	9.4	8.7	10.2
Accidental traumatismby fall	8.4	7.9	8.1	7.7	8.4	7.3	7.1	7.3	8.0	10.4	11.9	13.2
Accidental traumatism by machines	1.3	1.4	1.3	1.3	1.7	1.6	1.0	1.7	1.6	2.4	2.0	1.8
Railroad accidents	4.1	4.2	4.0	4.0	4.9	4.1	3.9	5.2	5.7	7.8	8.5	9.5
Auto accidents	18.6	17.0	16.8	15.9	15.4	13.6	12.2	11.1	10.7	10.3	9.7	2.3
All other accidents	19.3	19.4	21.2	19.7	19.5	18.0	18.5	19.5	21.2	26.1	26.8	31.6
War deaths	(1)	(1)	(1)	(1)	-----	.1	.1	.5	16.6	39.7	13.5	-----
Other diseases and conditions	181.0	183.6	183.4	180.9	181.7	185.1	190.5	197.8	193.5	219.7	231.9	283.5

[1] Death rate less than 0.05 per 100,000.

NATIONAL NEGRO HEALTH WEEK TO BE OBSERVED APRIL 1 TO 8, 1928

The week of April 1 to April 8, 1928, has been set aside for the fourteenth observance of National Negro Health Week. State and municipal health departments, voluntary health organizations, and numerous other official and unofficial agencies interested in race welfare and advancement are cooperating with the United States Public Health Service in a determined effort to improve health and living conditions.

As a first step in this widespread health campaign this year the Public Health Service announces the issuance of the annual National

Negro Health Week Bulletin. This publication outlines effective methods of instituting and successfully carrying out the program of the health week. It is designed primarily for churches, schools, fraternal organizations, welfare societies, and other groups interested in community progress and race betterment, and contains, in addition to methods for organizing the programs for health week, information and sources of materials of value for health-week work.

It is the plan of the campaign to set aside each day of the week for special observance of some phase of health work. Sunday, April 1, will be mobilization day; Monday, April 2, home hygiene day; Tuesday, April 3, community sanitation day; Wednesday, April 4, children's health day; Thursday, April 5, adult's health day; Friday, April 6, special campaign day; Saturday, April 7, general clean-up day; Sunday, April 8, report and follow-up day.

In addition to the bulletin there is being distributed this year a specially prepared poster which gives in brief and interesting form the various rules of health and appropriate information and which has for a number of years contributed to the success of National Negro Health Week. This poster is a beautifully printed three-color illustration, and it is the aim of the committee in charge of this activity to have a copy placed in every home.

The poster is being issued in a very limited edition for free distribution. Single copies or quantities of the poster or bulletin may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Health officials, race leaders, and others interested in the successful promotion of this health-week observance can secure sample copies of the bulletin or additional information as to the proposed plan of the health week by writing the United States Public Health Service, Washington, D. C., or the National Negro Health Week Committee, Tuskegee, Ala.

CLAIM AGAINST CITY BECAUSE OF ILLNESS FROM TYPHOID FEVER

The following item regarding a claim against a municipality on account of the contraction of typhoid fever, alleged to have been due to the city's negligence, is taken from the February 6, 1928, issue of the Health News, published by the New York State Department of Health:

The father of a girl who contracted typhoid fever during an outbreak of the disease in the city of Cohoes last October has filed with the comptroller and the commissioner of public works of that city a claim of $5,000 for damages and $1,000 for expenses of the sickness and the loss of his daughter's services. If the claims are not allowed by the city within three weeks, papers are ready for starting action in the supreme court, according to the Cohoes American.

It is alleged that the girl contracted typhoid fever as a result of drinking water coming from the city main into her home. The city is called grossly negligent in permitting polluted water from the canal to enter the city mains at an industrial plant through a cross connection which it is claimed has existed since July 1, 1926, in violation of regulation 15-a of Chapter VII of the Sanitary Code.

On September 18 water was shut off from the mains in that section of the city and the plant in question is said to have then pumped water from the canal to maintain pressure in its sprinkler system. It is alleged that the polluted water was forced through the cross connection into the city mains, mingling with the city water when the latter was turned on. There were 48 cases of typhoid fever reported from the general vicinity of this cross connection.

COURT DECISION RELATING TO PUBLIC HEALTH

Garbage ordinance held reasonable.—(Washington Supreme Court; State (city of Auburn) *v.* Spiller, 262 P. 128; decided December 21, 1927.) An ordinance of the city of Auburn, which required the maintenance and use of a metal garbage can by householders and operators of business places, also contained the following provision:

> * * * that in any prosecution for the violation of any provision of this section it shall be competent to prove that the person failing to furnish and provide or maintain such metallic can or deposit garbage therein as in this section provided is purchasing water from the city of Auburn for use upon such premises, and proof of such purchase of water shall be prima facie evidence that garbage is accumulating upon such premises.

This provision was attacked and the supreme court, after citing cases sustaining the validity of a legislative presumption of one fact from evidence of another, decided that there was in the instant case a rational connection between the fact proved and the ultimate fact presumed, saying:

> * * * The lawmaking body evidently reasoned that the purchasing of water from the city by a person in possession or in charge of premises located therein for use on such premises must of necessity be using them in such a manner as to accumulate garbage. While the reasoning may be somewhat attenuated, we can not conclude that it is without foundation. There are uses, of course, to which the water could be put which would not result in the accumulation of garbage, but such uses are occasional rather than general The more common use of water by persons residing in municipalities is for household purposes, and to conduct a household of necessity results in the accumulation of garbage. In this connection it may be well again to call attention to the fact that the presumption to which the ordinance gives rise is not conclusive. It is a prima facie presumption only, and does not shut out from a party affected the right to show that the actual fact is otherwise.

The court also stated that "we find nothing unreasonable in the regulations of the ordinance now before us."

PUBLIC HEALTH ENGINEERING ABSTRACTS

United States District Court Upholds Minneapolis Zoning Ordinance. Anon. *Engineering News-Record*, vol. 99, No. 13, September 29, 1927, p. 525. (Abstract by E. G. White.)

The Federal District Court of Minnesota, on September 8, 1927, rendered two decisions upholding the Minneapolis zoning ordinance. Four instances are cited where zoning ordinances were upheld by the United States Supreme Court, at Euclid, Ohio, November, 1926; Minneapolis, March, 1927; Roanoke, Va., May, 1927; and Los Angeles, June, 1927.

The case decided by the Federal District Court on September 8 involved an attempt to compel the city of Minneapolis to allow the use of property for industrial purposes which had been zoned for multiple family residences. The property had once been zoned for industrial purposes, but at the request of the board of regents of the University of Minnesota had been rezoned as dwelling property to protect the university neighborhood from industrial encroachment. Judge John B. Sanborn, who rendered the decision, expressed an opinion to the effect that the theory of zoning ordinances is good, but may be unjustly applied in some cases. He was not of the opinion, however, that judges of the Federal court could remedy matters by substituting their judgment for that of the legislative bodies.

Cities of the United States with Zoning Ordinances Totaled 553 on July 1. Anon. *Engineering News-Record*, vol. 99, No. 13, September 29, 1927, p. 526. (Abstract by E. G. White.)

According to a report issued by the United States Department of Commerce on July 1, 1927, a total of 553 cities in the United States had adopted zoning ordinances. New York was the first, in 1916, and the other cities range in size down to places with less than 1,000 population. New York State heads the list, having 93 cities, while 8 States have only one city each with zoning ordinances. In all, 46 States and the District of Columbia permit at least some municipalities to zone themselves, and of these 28 follow largely the "standard State zoning enabling act" issued by the Department of Commerce first in 1924.

The Maintenance of Satisfactory Air Temperatures in Living Spaces and Working Spaces in Ships of the British Navy. T. B. Shaw. Journal of State Medicine, vol. 35, No. 10, October, 1927, pp. 575-590. (Abstract by Leonard Greenburg.)

Captain Shaw emphasizes the fact that the ill effects of poorly ventilated quarters are due to physical and not to chemical changes in the atmosphere. Ventilation, he says, implies not only adequate air renewal but also the maintenance of the air in a satisfactory condition of temperature, moisture, and movement, and of these three conditions temperature is the most important.

From the point of view of the Navy the following questions require consideration: (1) Wild heat and methods for its control; (2) excessive heating in the Tropics and subtropical seas and its control; (3) heating arrangements in cold weather.

Wild heat is that heat which is generated in the boiler or engine rooms of the ship and is transmitted from these and hot pipes in the ship through the metal structures and into the living quarters on board. Much can be done in the limitation of this when the ships are under construction by the use of nonconducting lagging materials wherever this heat may be released. In addition, the supply of fresh, cool air by fan systems, as well as the removal of warm air by exhaust systems, is indicated, and finally the selection of suitable sites for sources of wild heat, such as dynamo and auxiliary engine rooms, is to be advocated. Such living spaces which are materially overheated may be rendered more livable by the rapid renewal of outdoor air, which is insured by a satisfactory method of plenum ventilation.

In tropical climates the problem of heat control on board ships becomes a still more difficult matter; for here, in addition to the heat generated within the ship, the direct action of the sun's rays on the ship's framework and the

warm state of the atmosphere add their quota to the temperature on board, and, moreover, the outdoor air is oftentimes not cool enough to serve as a cooling agent for use by exhaust fans. Under these conditions the sources of wild heat must be carefully examined and efforts made to reduce the transmission of heat in every possible manner. The regulation of the use of steam and the use of hot water for bathing at certain stated periods in the morning and afternoon may aid in the temperature control of certain portions of the ship; and finally the necessity for a generous supply of table fans to secure wide air motion is advocated.

Measures should be taken to diminish in so far as possible the heat absorption by the decks and the sides of the ship. This heat may be controlled by the use of white paint, awnings, and nonconducting materials. Sleeping on deck should be encouraged, not only because the open air insures greater comfort but also because of the relief from overcrowding the spaces below deck.

The part played by clothing is exceedingly important, and men working in spaces between decks in the Tropics should remove their jumpers in order that the heat loss from the body may be increased. In temperate climates, also, this procedure may be utilized to advantage.

The possibility of cooling air for use between decks is discussed, and in this connection the author points out that in temperate climates magazine cooling and that required for cold storage constitute a severe drain on the refrigerating apparatus on board ship. Apparatus must, however, be installed for cooling air in any compartment occupied by men in which the temperature will rise to an extent which will endanger life. For certain workshops situated in close proximity to wild heat which can not be effectively combated it is essential to supply cool air.

In H. M. ships the methods of heating in cold weather are (1) indirect—steam heaters, and (2) direct—stoves, electric radiators.

The indirect method consists in by-passing the air from the supply fan through a chamber in which heating coils are placed. When it is desired to warm the air, steam is admitted to the coils and the by-pass is so altered that the air will circulate between the coils. In temperate climates it is rarely necessary to pass more than one-third of the air through the heater in order to obtain the desired temperature. Care must be exercised when such heaters are in use to prevent the overheating of the room air. In the British Navy a ventilation committee is in charge of such matters and this committee should take the necessary steps to secure adequate control of the heaters.

Captain Shaw is of the opinion that the combined system of heating and ventilation such as described is the most suitable for use on H. M. ships. He feels that this is distinctly superior to the employment of so-called steam or hot-water radiators. The same heating apparatus should not be used for several compartments unless the conditions affecting the temperature in each are approximately the same. The quantity of wild heat certainly has an important bearing on the design of the heat-supply system for each compartment.

Prior to the introduction of electricity, stoves were largely used for heating purposes, and coal-burning stoves of the closed type are still used in officers' messes and admirals' and commanding officers' apartments. The necessary draft up the flue should be insured by trimming the funnel of all stoves on deck; and when the funnel must be unshipped and the openings in the deck closed by a deck plate, care must be exercised to see that the fire is completely extinguished beforehand.

The electric radiator is a most valuable heater for use in submarines as well as surface ships. It is simple and clean and produces no products which pollute the atmosphere. In many other ways, also, does electricity aid in the problem

of naval hygiene by making it possible to obtain adequate lighting and improved air conditions and by the elimination of the pollution which would result from the use of lamps and candles. Wild heat throughout the ship has been reduced by the use of electricity in place of steam in many ways.

School Ventilation. Its Effect on the Health of the Pupil. Thomas J. Duffield. *American Journal of Public Health,* vol. 17, No. 12, December, 1927, pp. 1226–1229. (Abstract by Leonard Greenburg.)

This is a progress report of the committee on heating and ventilating of the American Public Health Association and was presented to that body at its fifty-sixth annual meeting at Cincinnati, Ohio (1927). The chief activity of the committee during the past year was an attempt at collaboration with the fresh air indoors committee of Rochester, N. Y., in a study of school ventilation. The American Society of Heating and Ventilating Engineers was also asked to colaborate in this study. Because of the fact that agreement between the American Public Health Association committee and the American Society of Heating and Ventilating Engineers committee on criteria for evaluation of ventilation was not forthcoming, a central conference committee on school ventilation, composed of seven members, was organized—three members from the American Society of Heating and Ventilating Engineers, two from the New York Commission on Ventilation, and one member each from the American Public Health Association and the joint committee of the American Medical Association and National Education Association. This central conference committee attempted to agree on a rating schedule or some other means of evaluating the conditions as found in window and fan-ventilated schools. The American Society of Heating and Ventilating Engineers proposed the use of a complex schedule based on air conditions maintained, whereas the other representatives favored a criterion based solely on the health of the school children. In view of this deadlock, the Rochester studies were dropped by the board of education of that city.

The American Public Health Association committee has been interested also in studies of school ventilation which were conducted by the New York Commission on Ventilation in Syracuse, N. Y., and Cattaraugus County, N. Y., and those conducted by the United States Public Health Service in New Haven, Conn. These studies agree in confirming the earlier studies of the New York State Commission on Ventilation in showing that, as gaged by the incidence of respiratory disease of the pupils, natural ventilation is superior to that produced by mechanical means under average conditions of operation.

The Cattaraugus County studies showed enormous differences in temperature between the floor and ceiling levels. In one case a difference of 45° F. was noted. The New York Commission on Ventilation plans to conduct experiments in an effort to maintain better air conditions in rural school rooms of this type.

Smoke and Air Pollution in a Modern City. H. B. Meller. *Pennsylvania's Health,* Pennsylvania Department of Health, vol. 5, No. 5, September–October, 1927, pp. 9 12. (Abstract by Leonard Greenburg.)

Smoke is the product of combustion, both solid and gaseous, emitted from the stack, and may include unconsumed carbon, various hydrocarbons, ash, sulphurous acid, chlorine, and ammonia. Part of this is visible and part may be invisible. The portion of the smoke which is visible is graded according to the Ringlemann Chart of the United States Bureau of Mines. Light smoke may be considered any which, while visible, is less than 60 per cent black. The atmospheric pollution to which people are subjected need not be only smoke, but, in addition, dust and pollution from other sources.

According to Doctor Meller, smoke and other substances which pollute the atmosphere irritate the sensitive membranes of the nose, eyes, throat, lungs, and gastrointestinal tract and diminish the potential reserve of the body. In addition to this, smoke and other solids in the atmosphere lessen the duration and intensity of sunshine and reduce the daylight which may be present. The importance of sunshine as a bactericidal and tonic agent is emphasized.

The systematic study carried on at the Mellon Institute showed that the average solid deposit throughout the city of Pittsburgh was approximately 1,000 tons per square mile per year. This was disclosed in the study undertaken in 1912. A resurvey in 1923–24 indicated that remarkable results had been obtained by the smoke ordinance. Visible smoke had been reduced approximately 60 per cent and dense smoke approximately 80 per cent, but the total deposit of solid matter (ash, iron oxide, and fixed carbon) had been increased practically 40 per cent. Doctor Meller points out that although now the visible smoke has been reduced, yet the increase in the solid particles constitutes an additional source of irritation to the respiratory membranes.

The author feels that a campaign of education, acquainting the general public with the gravity of the air-pollution evil, the provision of facilities to permit the control of visible smoke to the limit physically possible, and research by the chemist, the physician, and the engineer to cover thoroughly the field of air pollution, are the three requisites of the problem at this time.

Effect of different kinds of pipe on quality of water supplies. H. W. Clark. *Journal New England Water Works Association*, vol. 41, No. 1, March, 1927, p. 31. (Abstract by H. D. Cashmore.)

Investigations have shown that no matter what kind of pipe is used the water will take into solution a part of the metal, the amount depending somewhat on the water and the quality of pipe.

Iron pipe is affected the most, except when galvanized. Tin-lined pipes are the least affected. Much zinc is taken into solution from galvanized-iron pipe and brass pipe, which also yields a small amount of copper. From copper pipes only a small amount of copper is taken, but any zinc present is readily dissolved. Lead pipes have long been known to yield lead, and for this reason are dangerous, as 0.04 parts per 100,000 in solution will cause lead poisoning of some people when habitually used. Some doubt exists in the minds of different authorities as to the effect of copper and zinc on the human system.

As a matter of precaution it is suggested that where such dangers as the above exist the pipes be flushed thoroughly each morning before using the water. A small amount of copper is always present in the human system, coming from water and certain foods.

Use of Lime in Water Softening and Water Purification. Charles P. Hoover. Ind. Eng. Chem., 19:567–70, May, 1927. Abstract by Edward S. Hopkins in the *Journal American Water Works Association*, vol. 18, No. 6, December, 1927, p. 763.

"In addition to its softening qualities, attention is called to the sterilizing action of excess lime in water treatment. A selective action for *B. coli* is suggested, tables being given to show that after five hours' contact using excess causticity this organism is killed. Elimination of color, iron, turbidity, and odor and increased sedimentation efficiency are claimed. Modern practice is to soften to point of precipitation of magnesium and then add excess of carbon dioxide gas to precipitate calcium hydroxide, followed by filtration. Gas is obtained by burning coke, oil, etc. It is possible also to use 'split' treatment, neutralizing excess lime with carefully controlled portions of raw water. Operating cost of such treatment is given."

Recarbonation of Softened Water. Charles P. Hoover. Ind. Eng. Chem., 19:784–6, July, 1927. Abstract by Edward S. Hopkins in the *Journal American Water Works Association*, vol. 18, No. 6, December, 1927, p. 764.

"Water softened with lime may deposit calcium carbonate in pipe lines with decrease of capacity, or choke filter beds by formation of 'balls' resulting in poor operating conditions. Such a condition is overcome by adding carbon dioxide to such a supply, thereby converting the slightly soluble calcium carbonate to the highly soluble calcium bicarbonate. Such practice is being conducted in numerous places in this country, operating conditions of certain plants being

quoted together with a description of the apparatus, as well as a comparison of cost of various fuels for the production of carbon dioxide upon a plant scale."

DEATHS DURING WEEK ENDED FEBRUARY 11, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended February 11, 1928, and corresponding week of 1927. (From the Weekly Health Index, February 16, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Feb. 11, 1928	Corresponding week 1927
Policies in force	70, 240, 787	66, 705, 342
Number of death claims	13, 626	12, 300
Death claims per 1,000 policies in force, annual rate	10. 1	9. 6

Deaths from all causes in certain large cities of the United States during the week ended February 11, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 16, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Feb. 11, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 11, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb. 11, 1928	Corresponding week 1927	
Total (68 cities)	7, 943	13. 6	13. 3	825	834	[3] 69
Akron	40			5	12	54
Albany [4]	41	17. 8	20. 5	8	2	164
Atlanta	83	17. 1	14. 0	9	2	
White	43		10. 7	6	1	
Colored	40	(5)	21. 9	3	1	
Baltimore [4]	239	15. 0	16. 0	28	27	89
White	182		12. 8	17	17	68
Colored	57	(5)	27. 7	11	10	172
Birmingham	74	17. 4	12. 0	17	8	145
White	33		10. 2	8	2	110
Colored	41	(5)	14. 8	9	6	203
Boston	242	15. 8	16. 0	22	42	61
Bridgeport	42			3	5	55
Buffalo	178	16. 7	10. 0	15	16	64
Cambridge	34	14. 1	15. 2	3	5	53
Camden	44	17. 0	12. 9	8	5	128
Canton	21	9. 4	13. 8	5	2	119
Chicago [4]	700	11. 6	12. 4	68	95	58
Cincinnati	144	18. 2	16. 8	11	14	66
Cleveland	173	9. 0	11. 4	18	27	49
Columbus	70	12. 3	12. 7	3	9	28
Dallas	43	10. 3	9. 9	7	6	
White	33		9. 1	5	5	
Colored	10	(5)	15. 2	2	1	
Denver	89	15. 8	13. 3	9	3	
Des Moines	30	10. 3	10. 2		2	
Detroit	299	11. 3	11. 3	50	52	77
Duluth	13	5. 8	7. 3	1	1	23
El Paso	39	17. 3	9. 2	7	2	
Erie	27			1	5	21
Fall River [4]	23	9. 0	11. 0	3	2	51
Flint	22	7. 7	12. 4	3	10	38
Fort Worth	28	8. 7	8. 3	3	3	
White	21		8. 7	1	2	
Colored	7	(5)	5. 3	2	1	
Grand Rapids	44	14. 0	11. 3	2	6	30
Houston	60			11	4	
White	40			8	3	
Colored	20	(5)		3	1	
Indianapolis	108	14. 8	16. 3	11	9	84
White	80		16. 8	4	8	35
Colored	28	(5)	12. 8	7	1	425
Jersey City	101	16. 3	12. 5	17	6	127
Kansas City, Kans	30	13. 3	12. 9	1	4	21
White	24		10. 8	1	3	25
Colored	6	(5)	22. 1	0	1	0
Kansas City, Mo	109	14. 6	11. 7	12	4	85

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended February 11, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927—Continued

City	Week ended Feb. 11, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 11, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb. 11, 1928	Corresponding week 1927	
Knoxville	36	17.9	14.3	6	2	130
White	21		12.2	4	2	97
Colored	15	(5)	20.9	2	0	427
Los Angeles	289			27	21	77
Louisville	67	10.6	14.5	3	5	25
White	53		12.5	2	3	19
Colored	14	(5)	25.0	1	2	69
Lowell	22	10.4	13.2	1	1	21
Lynn	24	11.9	11.9	3	4	76
Memphis	85	23.4	16.6	18	6	211
White	48		14.9	7	3	131
Colored	37	(5)	19.7	11	3	345
Milwaukee	136	13.1	12.3	17	20	76
Minneapolis	98	11.2	10.7	8	7	48
Nashville	45	17.0	16.3	5	0	79
White	29		10.5	3	0	64
Colored	16	(5)	30.8	2	0	120
New Bedford	45	19.7	17.9	8	3	173
New Haven	63	17.5	14.9	6	7	85
New Orleans	143	17.4	19.2	10	13	48
White	79		15.8	6	5	44
Colored	64	(5)	28.8	4	8	58
New York	1,658	14.4	13.0	177	147	71
Bronx Borough	195	10.7	9.2	14	10	42
Brooklyn Borough	514	11.6	11.7	67	63	67
Manhattan Borough	721	21.5	17.9	70	58	83
Queens Borough	181	11.1	9.9	21	14	85
Richmond Borough	47	16.3	13.2	5	2	90
Newark, N. J.	121	13.4	11.2	15	25	77
Oakland	66	12.6	12.5	1	13	11
Oklahoma City	33			2	0	
Omaha	60	14.1	11.7	9	5	104
Paterson	44	15.9	12.7	8	4	139
Philadelphia	534	13.5	15.2	43	58	58
Pittsburgh	210	16.3	13.5	28	24	92
Portland, Oreg.	84			8	5	86
Providence	75	13.7	11.1	5	12	41
Richmond	52	14.0	14.7	5	4	65
White	33		14.5	4	4	81
Colored	19	(5)	15.0	1	0	37
Rochester	82	13.1	13.8	9	7	73
St. Louis	226	13.9	12.8	20	13	67
St. Paul	52	10.8	11.7	3	4	29
Salt Lake City	37	14.0	14.6	6	8	98
San Antonio	62	14.9	14.3	8	11	
San Diego	46	20.1	18.5	1	1	19
San Francisco	156	13.9	14.2	7	5	44
Schenectady	28	15.7	11.7	1	5	31
Seattle	69	9.4	11.4	3	2	31
Somerville	35	17.8	10.8	2	4	69
Spokane	29	13.9	18.7	2	1	52
Springfield, Mass.	35	12.2	12.4	4	4	63
Syracuse	50	13.1	13.2	3	15	36
Tacoma	19	9.0	9.7	1	1	28
Toledo	81	13.5	13.8	11	6	105
Trenton	38	14.3	14.5	5	5	85
Washington, D. C.	143	13.5	14.4	14	7	80
White	83		12.7	4	5	33
Colored	60	(5)	19.5	10	2	185
Waterbury	24			3	4	87
Wilmington, Del.	36	14.6	9.5	0	3	0
Worcester	51	13.5	14.4	3	6	36
Yonkers	27	11.6	10.5	1	2	23
Youngstown	36	10.8	10.8	4	0	53

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 67 cities.
[4] Deaths for week ended Friday, Feb. 10, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisaille, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended February 19, 1927, and February 18, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 19, 1927, and February 18, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928
New England States:								
Maine	2	8	6	5	192	29	0	0
New Hampshire		7		24		48		0
Vermont					85	6	0	0
Massachusetts	91	120	14	21	154	1,833	1	2
Rhode Island		6				26		0
Connecticut	41	29	14	10	89	318	2	0
Middle Atlantic States:								
New York	508	404	[1] 140	[1] 36	1,003	1,723	3	13
New Jersey	135	149	41	18	64	451	3	1
Pennsylvania	211	268			907	1,323	1	2
East North Central States:								
Ohio		78		19		423		7
Indiana	56	33	78	31	236	141	1	0
Illinois	141	177	50	18	2,340	103	3	7
Michigan	130	62		4	277	572	0	4
Wisconsin	49	36	98	88	765	47	2	2
West North Central States:								
Minnesota	31	39	3	2	301	5	1	3
Iowa [2]	24	14			729	56	0	7
Missouri	65	46	10	25	272	133	0	3
North Dakota	2	5		2	102	4	2	2
South Dakota		2	1		148	21	0	0
Nebraska	5	12	1	3	105	3	0	2
Kansas	11	13	36	31	795	31	5	2
South Atlantic States:								
Delaware		2			7	10	0	0
Maryland [2]	56	40	162	40	30	696	2	1
District of Columbia	43	33	24	4	1	61	0	0
Virginia							1	
West Virginia	85	45	50	74	118	118	0	0
North Carolina	29	39			476		0	
South Carolina	16	18	636	1,423	34	1,430	0	0
Georgia	15	13	99	281	64	214	1	1
Florida	17	8	7	15	93	19	0	1
East South Central States:								
Kentucky		6		13		268		0
Tennessee	9	13	58	102	80	457	2	1
Alabama	69	23	61	137	181	264	0	0
Mississippi	11	13						

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 19, 1927, and February 18, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928
West South Central States:								
Arkansas	7	8	74	275	23	605	0	0
Louisiana	28	21	7	70	141	166	1	0
Oklahoma [3]	18	27	285	209	252	220	1	2
Texas	56	68	17	140	129	118	1	1
Mountain States:								
Montana	5	18	-------	-------	77	----	2	5
Idaho	2	1	-------	-------	101	-----	2	0
Wyoming	1	2	-------	-----	239	15	0	1
Colorado	-------	5	-------	2	-----	40	-----	3
New Mexico	1	2	2	1	72	163	0	0
Arizona	1	5	-------	-------	5	4	1	2
Utah [2]	11	3	5	-------	547	1	1	4
Nevada	-------	-------	-----	-------	--	-------	-------	-------
Pacific States:								
Washington	24	11	2	-----	173	278	7	4
Oregon	10	6	460	28	87	78	0	3
California	133	109	55	56	2,587	146	8	8

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928
New England States								
Maine	1	0	37	40	0	0	0	5
New Hampshire	-	1	-----	34	-------	0	------	0
Vermont	0	0	7	6	0	0	3	0
Massachusetts	0	4	516	327	0	0	4	2
Rhode Island	-----	0	-------	59	-------	0	-------	0
Connecticut	0	0	118	86	0	1	3	1
Middle Atlantic States:								
New York	2	2	1,213	776	6	4	21	18
New Jersey	1	1	428	283	0	0	6	2
Pennsylvania	0	1	651	603	0	1	14	12
East North Central States.								
Ohio	---	3	---	278	-----	23	-------	7
Indiana	0	0	317	145	150	116	2	8
Illinois	2	1	432	316	21	77	19	14
Michigan	0	0	364	262	56	42	12	7
Wisconsin	0	2	235	192	23	58	4	3
West North Central States:								
Minnesota	1	0	225	173	12	3	4	4
Iowa [2]	0	0	90	110	1	98	0	2
Missouri	0	0	143	113	17	25	2	2
North Dakota	0	1	73	62	4	7	0	1
South Dakota	0	0	65	33	5	9	0	1
Nebraska	0	0	65	96	8	22	1	0
Kansas	0	0	210	188	70	78	3	0
South Atlantic States:								
Delaware	0	0	58	4	0	0	0	0
Maryland [2]	1	0	94	60	1	0	14	3
District of Columbia	0	0	19	54	0	0	0	0
Virginia	0	-------	-------	-------	0	-----	0	-------
West Virginia	0	0	63	64	23	102	13	5
North Carolina	3	1	45	43	71	93	9	4
South Carolina	0	0	8	10	13	12	2	8
Georgia	0	0	16	25	100	0	1	4
Florida	0	0	14	12	45	2	9	4
East South Central States:								
Kentucky	-------	0	-------	45	-------	16	-------	4
Tennessee	0	0	12	26	7	33	8	9
Alabama	0	2	15	13	46	4	41	2
Mississippi	0	0	24	11	4	0	2	6
West South Central States:								
Arkansas	0	0	11	21	2	0	2	3
Louisiana	1	0	9	8	6	33	5	17
Oklahoma [3]	1	1	53	77	38	94	17	14
Texas	0	0	71	88	53	62	8	4

[2] Week ended Friday.

[3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 19, 1927, and February 18, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928	Week ended Feb. 19, 1927	Week ended Feb. 18, 1928
Mountain States:								
Montana	1	0	76	11	3	27	1	0
Idaho	0	1	34	5	4	6	3	0
Wyoming	0	0	19	17	0	0	0	0
Colorado		0		137		9		0
New Mexico	0	1	28	14	4	1	1	4
Arizona	0	0	4	4	1	28	3	0
Utah [1]	0	2	25	9	1	22	0	0
Nevada								
Pacific States:								
Washington	1	0	106	52	47	26	1	3
Oregon	0	3	57	24	47	59	9	0
California	1	7	268	247	31	18	3	13

[1] Week ended Friday.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December, 1927										
District of Columbia	4	63	6		11	1	14	135	2	2
Kansas	2	138	21		92		3	559	260	23
January, 1928										
Indiana	5	188	152		318		7	466	471	17
Maine	0	13	21		248		4	141	0	11
North Dakota	13	23			45		4	140	14	5
Vermont	0	5			74		0	54	0	1

December, 1927

	Cases
Chicken pox:	
District of Columbia	107
Kansas	902
German measles:	
Kansas	6
Malta fever:	
Kansas	3
Mumps:	
Kansas	118
Rabies in animals:	
District of Columbia	2
Trachoma:	
Kansas	1
Vincent's angina:	
Kansas	4
Whooping cough:	
District of Columbia	29
Kansas	253

January, 1928

	Cases
Chicken pox:	
Indiana	236
Maine	161
North Dakota	73
Vermont	256

January, 1928—Continued

	Cases
German measles:	
Maine	8
Lethargic encephalitis:	
Maine	1
North Dakota	14
Mumps:	
Indiana	74
Maine	80
North Dakota	19
Vermont	198
Scabies:	
North Dakota	6
Septic sore throat:	
Maine	1
Vincent's angina:	
Maine	9
Whooping cough:	
Indiana	66
Maine	74
North Dakota	18
Vermont	64

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 101 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,650,000. The estimated population of the 95 cities reporting deaths is more than 30,960,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended February 4, 1928, and February 5, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	2,282	2,155	
101 cities	1,152	1,156	1,082
Measles:			
42 States	14,034	12,413	
101 cities	4,384	3,397	
Poliomyelitis:			
43 States	59	13	
Scarlet fever:			
43 States	5,166	6,469	
101 cities	1,635	2,397	1,504
Smallpox:			
43 States	1,338	1,374	
101 cities	127	118	103
Typhoid fever:			
43 States	226	208	
101 cities	42	43	39
Deaths reported			
Influenza and pneumonia:			
95 cities	1,0[illegible]	1,088	
Smallpox:			
95 cities	1	0	
Terre Haute	1	0	

City reports for week ended February 4, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	4	1	1	0	0	2	12	5
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	2
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	40	54	32	1	0	465	9	27
Fall River	131,000	0	6	3	0	0	1	0	1
Springfield	145,000	6	3	3	0	1	1	55	1
Worcester	193,000	8	6	5	0	0	4	64	3
Rhode Island:									
Pawtucket	71,000	5	1	3	0	0	4	6	0
Providence	275,000	1	10	11	0	2	3	7	5
Connecticut:									
Bridgeport	([2])	4	8	12	0	0	1	0	0
Hartford	164,000	19	8	14	0	0	1	7	7
New Haven	182,000	8	3	0	0	1	174	17	4
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	29	15	25	------	0	535	0	17
New York	5,924,000	181	215	383	47	19	164	32	234
Rochester	321,000	12	12	15	------	0	2	7	11
Syracuse	185,000	23	5	2	------	0	102	7	4
New Jersey:									
Camden	131,000	3	5	9	0	1	0	3	6
Newark	459,000	20	15	25	9	1	173	15	23
Trenton	134,000	2	6	2	0	0	7	1	3
Pennsylvania:									
Philadelphia	2,008,000	91	81	71	------	5	106	97	34
Pittsburgh	637,000	20	22	39	------	3	179	112	28
Reading	114,000	13	4	0	------	0	1	0	5
Scranton	143,000	2	------	7	------	------	2	0	------
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	18	11	7	0	4	233	7	6
Cleveland	960,000	63	35	53	4	4	31	170	16
Columbus	285,000	11	5	4	0	0	1	6	8
Toledo	295,000	36	8	2	0	0	326	17	8
Indiana:									
Fort Wayne	99,900	0	3	3	0	0	0	0	3
Indianapolis	367,000	29	10	8	0	0	16	64	19
South Bend	81,700	0	1	0	0	0	0	0	0
Terre Haute	71,900	2	1	0	0	1	0	0	3
Illinois:									
Chicago	3,048,000	98	94	92	16	8	31	43	95
Peoria	82,500	3	0	2	0	0	0	0	1
Springfield	64,700	6	2	0	1	1	0	19	1

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended February 4, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit	1,290,000	37	64	32	3	2	218	66	31
Flint	136,000	10	7	6	0	0	2	94	4
Grand Rapids	156,000	6	3	0	0	0	11	15	2
Wisconsin:									
Kenosha	52,700	10	2	3	0	0	0	2	0
Milwaukee	517,000	57	20	12	0	0	3	17	7
Racine	69,400	6	2	2	0	0	2	9	0
Superior	[1] 39,671	2	0	0	0	0	0	0	2
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,600	3	1	0	0	0	0	6	2
Minneapolis	434,000	78	19	10	0	2	1	11	5
St. Paul	248,000	13	14	2	0	1	1	53	4
Iowa:									
Davenport	[1] 52,469	2	1	0	0	----	0	0	---
Des Moines	146,000	0	3	0	0	--	0	0	-
Sioux City	78,000	11	2	0	0		47	14	-
Waterloo	36,900	1	1	1	0	- --	1	0	-
Missouri:									
Kansas City	375,000	20	9	9	0	1	[illegible]	145	0
St. Joseph	78,400	1	3	0	0	0	0	1	3
St. Louis	830,000	17	50	33	1	1	58	13	-
North Dakota:									
Fargo	[1] 26,403	5	0	0	0	0	0	1	2
Grand Forks	[1] 14,811	1	0	0	0	--------	1	0	--- ----
South Dakota:									
Aberdeen	[1] 15,036	2	0	0	0		0	0	--
Sioux Falls	[1] 30,127	0	0	0	0		0	0	-
Nebraska:									
Lincoln	62,000	14	2	1	0	0	1	21	0
Omaha	216,000	11	5	1	0	0	0	3	7
Kansas:									
Topeka	56,500	24	2	0	1	0	3	0	[illegible]
Wichita	92,500	13	4	2	0	0	0	0	1
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	3	3	5	0	0	1	7	0
Maryland:									
Baltimore	808,000	91	36	31	21	5	430	11	42
Cumberland	[1] 33,741	2	1	0	0	0	0	0	1
Frederick	[1] 12,035	1	0	0	0	0	0	0	0
District of Columbia:									
Washington	528,000	16	21	38	0	0	22	0	18
Virginia:									
Lynchburg	30,500	6	2	6	0	0	1	0	2
Norfolk	174,000	19	2	1	0	0	11	0	5
Richmond	189,000	1	5	5	0	1	60	0	5
Roanoke	61,900	0	2	0	0	1	0	1	2
West Virginia:									
Charleston	50,700	10	2	0	0	0	0	0	2
Wheeling	[1] 56,208	4	1	0	0	0	0	0	3
North Carolina:									
Raleigh	[1] 30,371	3	0	0	0	0	18	0	0
Wilmington	37,700	3	1	1	0	1	48	0	5
Winston-Salem	71,800	3	0	1	0	0	138	19	2
South Carolina:									
Charleston	74,100	0	1	2	132	0	4	0	7
Columbia	41,800	7	0	1	0	0	160	22	5
Greenville	[1] 27,311	1	0	0	0	0	75	6	0
Georgia:									
Atlanta	([2])	5	3	4	51	3	5	13	7
Brunswick	[1] 16,809	0	0	0	0	0	50	0	1
Savannah	94,900	1	1	2	6	0	16	0	5
Florida:									
Miami	[1] 69,754	8	2	1	0	0	0	2	0
St. Petersburg	[1] 26,847	--------	0	--------	--------	0	--- -	--------	1
Tampa	102,000	10	1	8	0	2	0	0	1

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended February 4, 1928—**Continued**

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	1	1	0	0	0	25	0	0
Lexington	47,500	0	------	0	0	0	1	1	0
Louisville	311,000	5	7	0	2	0	31	23	6
Tennessee:									
Memphis	177,000	13	4	5	0	1	109	43	6
Nashville	137,000	4	0	1	0	3	1	13	4
Alabama:									
Birmingham	211,000	3	3	3	19	6	13	6	7
Mobile	66,800	0	0	0	0	3	0	0	2
Montgomery	47,000	3	1	2	1	------	0	0	------
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	2	0	0	0	------	2	1	------
Little Rock	75,900	1	1	0	1	0	122	1	2
Louisiana:									
New Orleans	419,000	4	12	5	8	6	0	0	13
Shreveport	59,500	0	1	2	0	0	34	0	3
Oklahoma:									
Oklahoma City	(2)	4	1	0	7	1	5	2	4
Tulsa	133,000	0	2	3	0	------	0	15	------
Texas:									
Dallas	203,000	------	7	8	4	4	2	------	5
Fort Worth	159,000	9	3	3	3	2	0	10	4
Galveston	49,100	1	1	3	0	0	2	0	1
Houston	[1] 164,954	4	6	9	0	0	2	1	13
San Antonio	205,000	1	2	11	0	1	65	5	14
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	1	0	0
Great Falls	[1] 29,883	2	1	0	0	0	0	0	2
Helena	[1] 12,037	0	1	5	0	0	0	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	1
Idaho:									
Boise	[1] 23,042	1	0	0	0	0	0	4	0
Colorado:									
Denver	285,000	43	12	4	------	4	9	69	14
Pueblo	43,900	7	2	1	0	2	3	0	3
New Mexico:									
Albuquerque	[1] 21,000	3	0	0	0	0	45	0	1
Utah:									
Salt Lake City	133,000	15	3	2	0	0	0	0	3
Nevada:									
Reno	[1] 12,665	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	21	6	5	0	------	197	14	------
Spokane	109,000	10	4	3	0	------	0	0	------
Tacoma	106,000	9	3	0	0	0	8	22	0
Oregon:									
Portland	[1] 282,383	29	10	5	0	1	6	4	7
California:									
Los Angeles	(2)	63	46	38	27	7	10	40	32
Sacramento	73,400	7	3	1	0	0	10	0	1
San Francisco	567,000	98	28	14	1	3	52	43	5

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended February 4, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	1	0	0	0	1	0	0	0	8	28
New Hampshire:											
Concord	1	0	0	0	0	0	0	0	0	0	9
Vermont:											
Barre	0	2	0	0	0	0	0	0	0	0	3
Massachusetts:											
Boston	85	79	0	0	0	9	1	0	0	41	217
Fall River	2	8	0	0	0	2	0	2	0	1	21
Springfield	8	15	0	0	0	4	0	0	0	7	37
Worcester	11	9	0	0	0	4	1	1	0	17	47
Rhode Island:											
Pawtucket	1	2	0	0	0	0	0	2	0	0	18
Providence	9	28	0	0	0	0	0	1	0	2	65
Connecticut:											
Bridgeport	13	1	0	0	0	2	0	0	0	6	28
Hartford	6	5	0	0	0	3	0	0	1	15	46
New Haven	10	6	0	0	0	0	1	0	0	28	--------
MIDDLE ATLANTIC											
New York:											
Buffalo	26	38	0	0	0	9	1	0	0	0	142
New York	281	323	0	0	0	121	8	3	3	186	1,607
Rochester	14	16	0	0	0	2	1	1	0	12	83
Syracuse	16	17	0	0	0	4	0	0	0	41	59
New Jersey:											
Camden	6	2	0	0	0	2	0	0	0	8	37
Newark	27	33	0	0	0	11	1	0	0	54	120
Trenton	5	7	0	0	0	2	0	0	0	1	31
Pennsylvania:											
Philadelphia	98	105	0	0	0	34	3	[illegible]	0	75	513
Pittsburgh	44	40	0	0	0	8	0	3	1	18	164
Reading	2	24	0	0	0	0	0	0	0	4	44
Scranton	------	2	-------	0	-------	------	------	0	--------	0	--------
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	21	21	1	1	0	12	0	0	0	5	126
Cleveland	45	47	1	0	0	12	0	0	0	67	179
Columbus	12	17	1	0	0	6	0	0	0	0	87
Toledo	15	18	1	0	0	9	0	0	0	7	73
Indiana:											
Fort Wayne	6	2	0	0	0	0	0	0	0	0	21
Indianapolis	9	15	11	5	0	6	0	0	0	1	100
South Bend	3	2	1	0	0	0	0	0	0	2	12
Terre Haute	4	1	0	4	1	2	0	0	0	0	27
Illinois:											
Chicago	148	132	2	3	0	50	3	3	0	154	863
Peoria	5	0	0	0	0	0	0	0	0	8	--------
Springfield	2	11	0	0	0	0	0	0	0	0	17
Michigan:											
Detroit	103	100	3	1	0	26	1	1	1	64	276
Flint	9	15	1	0	0	0	0	0	0	5	21
Grand Rapids	13	6	0	0	0	1	0	0	0	4	27
Wisconsin:											
Kenosha	1	13	1	0	0	0	0	0	0	5	--------
Milwaukee	30	48	2	0	0	12	0	0	0	29	121
Racine	6	9	1	0	0	0	0	0	0	16	8
Superior	4	8	2	0	0	0	0	0	0	0	11
WEST NORTH CENTRAL											
Minnesota:											
Duluth	10	8	1	0	0	1	0	0	0	5	22
Minneapolis	62	24	6	3	0	5	1	0	0	3	108
St. Paul	36	11	6	0	0	4	0	0	0	7	57
Iowa:											
Davenport	0	15	2	0	--------	--------	0	0	--------	0	--------
Des Moines	7	30	1	19	--------	--------	0	0	--------	0	--------
Sioux City	2	2	2	1	--------	--------	0	0	--------	3	--------
Waterloo	2	4	0	0	--------	--------	0	0	--------	0	--------

City reports for week ended February 4, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL—continued											
Missouri:											
Kansas City	14	24	3	1	0	4	0	0	0	11	113
St. Joseph	3	2	0	17	0	2	0	0	0	0	29
St. Louis	52	25	3	0	0	11	1	0	0	20	259
North Dakota:											
Fargo	2	5	0	0	0	0	0	0	0	1	14
Grand Forks	1	2	1	0	-------	-------	0	0	-------	0	-------
South Dakota:											
Aberdeen	0	0	0	0	-------	-------	0	0	-------	4	-------
Sioux Falls	3	1	1	0	-------	-------	0	0	-------	0	5
Nebraska:											
Lincoln	3	2	1	16	0	0	0	0	0	13	22
Omaha	5	10	9	0	0	2	0	1	0	1	73
Kansas:											
Topeka	1	1	0	8	0	0	0	0	0	27	22
Wichita	3	11	0	30	0	1	0	0	0	0	28
SOUTH ATLANTIC											
Delaware:											
Wilmington	6	1	0	0	0	0	0	0	0	1	27
Maryland:											
Baltimore	46	34	0	0	0	15	2	0	0	25	235
Cumberland	1	1	0	0	0	0	0	0	0	0	7
Frederick	1	0	0	0	0	0	0	0	0	0	1
District of Columbia.											
Washington	26	36	2	0	0	19	1	0	0	10	150
Virginia:											
Lynchburg	1	3	0	0	0	0	0	0	0	2	9
Norfolk	3	13	1	0	0	2	0	0	0	2	-------
Richmond	4	0	0	0	0	2	0	0	0	0	45
Roanoke	2	2	0	0	0	1	0	0	0	4	19
West Virginia											
Charleston	1	3	0	0	0	0	0	2	0	0	32
Wheeling	2	0	0	0	0	0	1	0	0	0	16
North Carolina:											
Raleigh	0	0	0	4	0	0	0	1	1	0	12
Wilmington	0	0	1	0	0	1	0	0	0	0	19
Winston Salem	1	4	4	0	0	1	0	0	0	0	10
South Carolina											
Charleston	0	0	0	0	0	1	1	0	0	1	28
Columbia	0	2	0	0	0	0	0	0	0	0	15
Greenville	0	0	1	0	0	1	0	0	0	0	3
Georgia:											
Atlanta	4	13	5	0	0	9	1	0	0	3	83
Brunswick	0	0	0	0	0	0	0	0	0	0	6
Savannah	1	1	1	6	0	2	0	0	0	0	31
Florida:											
Miami	1	1	1	0	0	2	1	0	0	0	31
St. Petersburg	0	-------	0	-------	0	0	0	-------	0	-------	17
Tampa	1	5	0	0	0	6	1	0	1	0	40
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	4	0	0	0	4	0	0	0	0	20
Lexington	-------	2	-------	0	0	2	-------	0	0	1	16
Louisville	6	16	0	0	0	1	0	0	0	1	48
Tennessee:											
Memphis	7	4	2	3	0	5	0	1	0	2	68
Nashville	4	0	1	0	0	4	1	0	0	0	47
Alabama:											
Birmingham	3	1	4	1	0	9	1	0	0	0	73
Mobile	1	1	1	0	0	2	0	2	0	0	22
Montgomery	0	0	0	0	-------	-------	0	0	-------	0	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0	-------	-------	0	0	-------	1	-------
Little Rock	1	5	0	1	0	3	1	0	0	0	-------

City reports for week ended February 4, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL—continued											
Louisiana:											
New Orleans	6	5	1	0	0	8	2	9	3	1	143
Shreveport	0	5	1	0	0	3	0	0	0	0	20
Oklahoma:											
Oklahoma City	2	10	3	15	0	1	0	0	0	0	36
Tulsa	2	7	0	5			0	0		1	
Texas:											
Dallas	3	12	2	1	0	0	0	1	0		46
Fort Worth	1	1	1	0	0	3	0	0	0	0	40
Galveston	0	1	1	0	0	2	1	0	0	0	10
Houston	2	3	2	1	0	4	0	0	0	0	61
San Antonio	1	2	0	0	0	2	0	0	0	0	53
MOUNTAIN											
Montana:											
Billings	0	1	0	1	0	0	0	0	0	0	5
Great Falls	2	5	1	6	0	0	0	1	1	0	12
Helena	0	2	0	2	0	0	0	0	0	0	2
Missoula	1	0	1	0	0	0	0	0	0	0	11
Idaho:											
Boise	1	1	0	0	0	0	0	0	0	0	6
Colorado:											
Denver	14	12	2	0	0	12	0	0	1	8	103
Pueblo	1	18	0	1	0	1	0	0	0	0	11
New Mexico:											
Albuquerque	2	0	0	0	0	3	0	0	0	0	12
Utah:											
Salt Lake City	3	3	2	3	0	2	0	0	0	11	28
Nevada:											
Reno	0	1	0	0	0	0	0	0	0	0	3
PACIFIC											
Washington:											
Seattle	12	6	4	2			0	0		7	
Spokane	6	10	5	8			0	0		0	
Tacoma	3	2	4	0	0	2	0	0	0	0	26
Oregon:											
Portland	6	5	8	14	0	1	1	1	0	0	73
California:											
Los Angeles	34	25	6	3	0	30	2	4	0	11	
Sacramento	1	6	1	9	0	3	0	0	0	0	31
San Francisco	17	36	3	1	0	16	1	0	0	8	168

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	1	0	0	0	1	1	0
Worcester	0	1	0	0	0	0	0	0	0
Rhode Island:									
Providence	1	1	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
Buffalo	0	1	0	0	0	0	0	0	0
New York	10	5	7	2	0	0	0	5	2
New Jersey:									
Camden	0	0	1	0	0	0	0	0	0
Newark	1	0	1	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	0	0	1	1	1	1	0	0	0
Pittsburgh	0	0	1	0	0	0	0	1	0

City reports for week ended February 4, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cleveland	1	0	1	1	0	0	0	1	1
Toledo	0	0	1	0	0	0	0	0	0
Indiana:									
Indianapolis	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago	8	5	0	0	0	0	0	0	0
Michigan:									
Detroit	0	0	0	0	0	0	0	0	1
Wisconsin:									
Milwaukee	3	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	0	0	1	0	0	0	0	0	0
Missouri:									
Kansas City	0	0	0	0	0	0	0	1	1
North Dakota:									
Fargo	0	0	3	0	0	0	0	0	0
Kansas:									
Wichita	1	1	0	0	0	0	0	0	0
SOUTH ATLANTIC [1]									
Maryland:									
Baltimore [1]	1	0	0	0	0	0	1	0	0
District of Columbia:									
Washington	0	1	0	0	0	0	0	0	0
South Carolina:									
Charleston	0	0	0	0	1	0	0	0	0
Florida:									
Tampa	0	0	0	0	0	2	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	1	0	0	0	0
Louisiana:									
New Orleans	1	0	1	0	0	0	0	0	0
Shreveport	0	1	0	0	0	0	0	0	0
Texas:									
Fort Worth	0	0	0	0	0	1	0	0	0
MOUNTAIN									
Colorado:									
Denver	6	3	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Tacoma	0	1	0	0	0	0	0	0	0
Oregon:									
Portland	1	0	1	0	0	0	0	0	0
California:									
Los Angeles	1	0	0	0	0	0	0	2	1
San Francisco	1	1	1	0	0	0	0	0	0

[1] Typhus fever: 1 case at Baltimore, Md., and 2 cases at Savannah, Ga.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended February 4, 1928, compared with those for a like period ended February 5, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927

and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, January 1 to February 4, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Jan. 8, 1927	Jan. 7, 1928	Jan 15, 1927	Jan. 14, 1928	Jan 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928
101 cities	198	[2] 168	186	200	175	193	177	[3] 193	194	190
New England	158	149	174	200	151	168	163	172	146	193
Middle Atlantic	182	202	176	253	191	252	194	251	229	278
East North Central	223	176	189	220	170	192	175	186	201	145
West North Central	188	115	158	111	146	138	127	131	123	113
South Atlantic	222	[2] 154	215	142	161	146	198	146	143	167
East South Central	137	90	248	50	152	105	101	[3] 87	127	55
West South Central	252	240	244	204	170	152	203	164	232	152
Mountain	126	71	117	115	117	168	197	124	188	106
Pacific	230	123	193	143	232	125	167	161	217	156

MEASLES CASE RATES

101 cities	384	[2] 518	339	566	451	619	425	[3] 583	570	724
New England	253	917	195	1,021	549	1,248	323	1,078	379	1,508
Middle Atlantic	31	466	38	500	49	478	46	483	41	618
East North Central	427	265	406	300	545	326	536	368	695	359
West North Central	259	134	192	109	277	259	297	138	453	222
South Atlantic	204	[2] 1,461	202	1,496	301	1,675	256	1,533	536	1,822
East South Central	106	1,566	96	1,521	203	1,387	185	1,621	269	1,192
West South Central	186	200	302	268	447	560	376	500	562	916
Mountain	5,227	62	3,434	106	5,074	97	4,447	88	7,217	115
Pacific	1,517	383	1,478	526	1,342	531	1,504	434	1,538	708

SCARLET FEVER CASE RATES

101 cities	318	[2] 208	366	258	384	260	386	[3] 278	403	270
New England	491	340	479	398	537	508	539	372	509	359
Middle Atlantic	285	196	338	266	368	268	378	288	433	295
East North Central	288	234	345	285	336	286	347	301	324	289
West North Central	449	203	556	261	517	224	487	273	521	247
South Atlantic	231	[2] 152	258	168	280	207	253	200	245	207
East South Central	233	190	213	140	335	190	319	[3] 116	243	130
West South Central	153	100	141	124	194	88	112	128	124	132
Mountain	950	195	1,112	301	1,345	265	1,605	301	1,515	380
Pacific	340	184	376	220	319	240	326	296	436	217

SMALLPOX CASE RATES

101 cities	22	[2] 17	22	23	20	22	26	[3] 23	25	21
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	1	0	1	0	0	0	0	0
East North Central	32	9	21	7	17	9	17	12	22	9
West North Central	57	105	69	146	59	121	79	121	53	117
South Atlantic	27	[2] 12	51	26	34	14	60	14	43	18
East South Central	41	5	86	15	25	55	86	[3] 29	101	29
West South Central	41	16	25	28	62	4	41	20	79	12
Mountain	0	106	0	142	0	106	9	133	9	115
Pacific	60	26	37	31	63	64	71	59	63	59

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] Atlanta, Ga., not included.
[3] Louisville, Ky., not included.

Summary of weekly reports from cities, January 1 to February 4, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1927—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928
101 cities	8	[2] 5	9	8	7	6	7	[3] 8	7	7
New England	9	7	21	14	2	9	5	21	9	14
Middle Atlantic	6	8	8	5	5	3	4	5	9	5
East North Central	5	3	1	3	6	6	2	5	5	3
West North Central	8	2	6	8	4	2	8	8	4	2
South Atlantic	7	[2] 15	16	2	7	5	18	7	5	5
East South Central	25	20	15	55	10	30	35	[3] 29	5	15
West South Central	25	0	17	20	4	12	0	40	17	40
Mountain	9	9	9	0	27	9	18	0	0	9
Pacific	8	5	21	10	21	8	21	0	8	10

INFLUENZA DEATH RATES

	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928
95 cities	20	[2] 19	21	24	[illegible]	24	25	[3] 19	19	19
New England	16	16	14	7	5	18	9	7	5	9
Middle Atlantic	18	13	20	21	20	19	22	16	21	14
East North Central	17	10	16	13	25	17	21	12	9	13
West North Central	11	4	10	14	4	18	4	10	12	10
South Atlantic	16	[2] 21	23	37	20	26	49	11	27	23
East South Central	48	89	37	78	16	105	32	[3] 101	58	68
West South Central	42	82	42	66	42	66	72	78	64	45
Mountain	63	53	99	62	54	71	72	80	45	53
Pacific	10	24	14	37	31	17	14	20	7	34

PNEUMONIA DEATH RATES

	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928
95 cities	195	[2] 170	179	191	183	179	158	[3] 159	168	150
New England	181	103	191	179	207	156	158	126	188	126
Middle Atlantic	208	186	204	214	197	193	174	183	197	129
East North Central	169	140	152	158	138	137	132	121	121	129
West North Central	116	124	124	112	116	137	126	98	135	49
South Atlantic	229	[2] 231	189	252	278	231	189	210	222	198
East South Central	213	235	207	225	255	251	213	[3] 171	207	131
West South Central	238	238	178	287	195	308	200	267	149	209
Mountain	368	195	197	168	215	186	170	177	143	203
Pacific	210	176	169	142	134	142	107	145	121	128

[2] Atlanta, Ga., not included. [3] Louisville, Ky., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,000	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended January 21, 1928.—The following report for the week ended January 21, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Suez.
Madagascar.—Tamatave.
Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Ceylon.—Colombo.
Dutch East Indies.—Makassar.

India.—Calcutta, Rangoon.
Straits Settlements.—Singapore.
Siam.—Bangkok.
French Indo-China.—Saigon-Cholon.

Ceylon.—Colombo.
China.—Shanghai.
French India.—Pondicherry.
India.—Bombay, Madras, Calcutta, Cochin, Rangoon, Moulmein, Vizagapatam.
French Indo-China,—Saigon-Cholon.
Dutch East Indies.—Belawan-Deli, Banjermassin, Pontianak.
Iraq.—Basrah.
Sarawak.—Kuching.
China.—Hong Kong.

Returns for the week ended January 21 were not received from Canton, China, or Vladivostok, Union of Socialist Soviet Republics.

ARABIA

Aden—Plague—January 9–17, 1928.—Plague was reported present at Aden, Arabia, January 9, 1928. The outbreak was stated to have occurred in a section of the town inhabited by coal coolies. All of the residents of this section were removed to Flint Island and isolated. On January 17 a small increase was reported in the number of cases first reported, occurring in the original infected area.

Quarantine and restrictive measures taken.—The section in which the outbreak occurred was stated to be under police guard. Quarantine measures applied to vessels in port were stated to be:

1. Medical inspection prior to embarkation of all passengers and members of crew joining the ship at Aden;
2. Disinfection prior to loading of merchandise considered liable to convey infection;
3. No visiting passengers allowed on shore and no persons allowed on ship other than those required for work on the vessel except under special permission of the port health officer.

ARGENTINA

Plague—Rosario—February 20, 1928.—A report of a case of bubonic plague at Rosario, Argentina, was received on February 20, 1928.

BRAZIL

Plague—Rio de Janeiro—February 16, 1928.—Under date of February 16, 1928, three cases of plague were reported at Rio de Janeiro, Brazil.

CANADA

Communicable diseases—Week ended February 4, 1928.—The Canadian Department of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended February 4, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever			1	1				2
Influenza	14			6				20
Lethargic encephalitis				2				2
Poliomyelitis							3	3
Smallpox				63		9	1	73
Typhoid fever	1	1	21	19				42

Quebec—Communicable diseases—Week ended February 4, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended February 4, 1928, as follows:

Disease	Cases	Disease	
Cerebrospinal meningitis	1	Scarlet fever	112
Chicken pox	21	Smallpox	11
Diphtheria	45	Tuberculosis	26
German measles	6	Typhoid fever	21
Influenza	1	Whooping cough	11
Measles	208		

CUBA

Habana—Communicable diseases—January, 1928.—During the month of January, 1928, communicable diseases were reported in Habana, Cuba, as follows:

Disease	New cases	Deaths	Remaining under treatment Jan. 31, 1928	Disease	New cases	Deaths	Remaining under treatment Jan. 31, 1928
Cerebrospinal meningitis			1	Measles	8		7
Chicken pox	7		6	Paratyphoid fever	2	1	1
Diphtheria	8	1	4	Scarlet fever	1		1
Leprosy			18	Typhoid fever [1]	33	2	45
Malaria [1]	43	2	7				

[1] Many of these cases from the interior.

DUTCH EAST INDIES

Plague—Island of Java—November 19–December 10, 1927.—During the period November 19 to December 10, 1927, plague was reported present in the Island of Java, Dutch East Indies, as follows: *Pasoeroean Residency*—November 28 and December 10, 1927, in two native villages in the Tengger District. *Surakarta Residency*—November 19, 1927, in 13 subdivisions and Klaten District. *Surabaya Residency*—at Grissae, a seaport town, December 1, 1927.

ECUADOR

Guayaquil—Plague—Examination of rats—Smallpox—December 16–31, 1927.—During the 16 days ended December 31, 1927, five cases of plague with two deaths were reported at Guayaquil, Ecuador. During the same period, of 11,634 rats taken, 11 rats were found plague infected.

During the same period, four cases of smallpox were reported at Guayaquil.

EGYPT

Suez—Plague—January 18, 1928.—A fatal case of plague occurring in a native who was found dead in his own house was reported at Suez, Egypt, January 18, 1928. The locality is 4 kilometers from the port.

JAMAICA

Smallpox (Alastrim)—January 1–28, 1928.—During the four weeks ended January 28, 1928, eight cases of smallpox (alastrim) were reported in the island of Jamaica, exclusive of Kingston.

Other communicable diseases.—During the same period other communicable diseases were reported in the island as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	3	23	Puerperal fever		1
Diphtheria		1	Tuberculosis	19	39
Dysentery	3	11	Typhoid fever	22	72
Leprosy		1			

Population, island, estimated 926,000 Kingston, census, 62,707

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927				December, 1927					January, 1928		
							5	12	19	26	3	10	17	24	31	7	14	21
China:																		
Amoy	C	2	28	72	16													
	D		7	3														
Canton	C	8	31	36	14	5	1	6			1							
	D	5	16	25	14	5	1	5			1							
Foochow	C	P	P	P	P													
Hong Kong	C	2	P	1	P													
	D	1																
Shanghai—(settlement and concession)																		
Foreigners only	C		1	6	3													
Including natives	D		20	74	7													
Swatow	C	72	42	P	P	P	P											
	D	1		P	P	P	P											
Tientsin	C	P	P	15	2	P	P					1						
Dutch East Indies: Java—Batavia	C						1	2	25	2	1							
	D						1	2	15	2	1							
India	C	46,137	45,163	31,390	20,160	5,303	4,845	5,987	6,912	8,102	5,997	5,766	5,274					
	D	24,081	22,051	15,895	10,371	2,867	2,641	3,350	4,005	4,835	3,672	3,355	3,164					
Bassein	D	16																
Bombay	C	75	42	3				2										
	D	35	30	2				2										
Calcutta	C	95	87	76	101	28	35	65	71	156	119	87	66	60	42	43		
	D	48	40	39	64	22	25	42	49	106	77	55	43	48	34	27		
Madras	C	424	547	59	14			6	7			1					1	18
	D	204	278	48	8			3	4	1		1					1	
Rangoon	C	2	1	2	6		1		1	3	1	2	2	1	2			
	D	2	1	2	5	1		3	4	2	1	2	1	1	1			4
Tuticorin	C				1						6		2					
	D				1	7	5	10	15		6	6	2					
India (French):																		
Karikal	C	56	18	1			1						1					
	D	45	12	1			1						1					

[illegible]	C	[illegible]	[illegible]	[illegible]			[illegible]				[illegible]	[illegible]	17					
	D	24	11	15			1				5	1	15					
Indo-China: Saigon	C			1	1											2	1	1
	D															1		
Iraq:[1]																		
Japan: Yokohama	C	1																
	D	1																
Philippine Islands: Manila	C	1	1															
Siam	C	81	77	40	18	14	23	43	30	19	29	18	32	24	24			
	D	59	53	24	11	10	15	25	26	11	19	13	21	18	21			
Bangkok	C	6	2	3	5		1		3		1	1	1	2	3	7	9	5
	D	1	1	1	3		1		1		1		1	2	1	3	11	7
Straits Settlements: Singapore	C					1		4	2	1	2		2	3	12	3	2	1
	D					1		4		2			2	1	3	5	2	2
On vessel:																		
S. S. Adrastus: At Yokohoma, Japan	C		1															
	D		1															
S. S. Tabaristan: At Basra, Iraq	C				1													

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927		
						1-10	11-20	21-30	1-10	11-20	21-31
Indo-China (French):											
Annam	C	911	1,628	640	226	13	75	38	16	2	
Cambodia	C	87	89	75	180	56	1	28	21	12	39
Cochin-China	C	257	68	144	178	21	27	52	17	38	58
Laos	C	20	190	36	67	10					
Tonkin	C	1,093	180	24	1			1			2
Kwang-Chow-Wan	C		1	15							

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths. The report of 29 cases of cholera with 18 deaths at Baghdad during the week ended July 30, 1927, which appeared in the PUBLIC HEALTH REPORTS Sept. 23, 1927, and in subsequent issues, was erroneous. The director of public health of Iraq states that cholera did not appear at Baghdad in 1927 until Oct. 20.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927 5	12	19	26	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	February, 1928 4	11
Algeria: Oran	C		4	1			1		1												
	D		3	1																	
Arabia: Aden	C																19	13	P		
	D																7	8			
Argentina:																					
Bahia Blanca District	C									1	1	1									
Buenos Aires	D																				2
Cordoba Province	C		2		P	P	P			10				1	1						
Entre Rios	C		5																		
Firmat	C												1								
Quilino	C									1	1	1									
Rosario	C									1	1	1	1	2	3				4		
Ucacha	C												1								
Azores: St. Michaels Island	C	2	2	2	3	1		1	1	1	1	1		1		1					
	D			1	1							1									
Brazil: Rio de Janeiro	D																	2			
British East Africa:																					
Tanganyiki	C	P	P		P	P	P														
Uganda	C	528	456	226	99																
	D	413	345	158	88																
Canary Islands:																					
Las Palmas	C				9					1			2			2		1			
Santa Cruz	C																	1			
Teneriffe	C																	1	3		
Ceylon: Colombo	C		1	3	1					1	1				2	1	1	1			
	D			3											1	1	1	1			
China:																					
Amoy	C	P																			
Tunghao	D				200																
Tientsin	C		2																		
Dutch East Indies:																					
Balik-Papan	C													1							
	D													1							

Celebes: Makassar	C						2	2	2	1		1		2	1		3	2			
	D						2	2	2	1		1		2	1		2	2			
Java	D			432	779	191	213	228	197												
Batavia and West Java	C	40	71	68	130	41	29	31	34	45	43	32	34	32							
	D	40	71	68	129	41	29	31	34	44	43	32	33	32							
Cheribon	C										1										
	D										1										
East Java and Madura	C	29	28	18	17	3	4	2	1	5	3										
	D	29	27	18	17	3	4	2	1	5	3										
Pasoeroean Residency	C									P	P	P									
Surakarta Residency	C								P	P	P										
Egypt:																					
Alexandria	C		2	1						5	3	2	2	3	2						
	D									5	3			1	1						
Suez	C			1													1				
	D																1				
Greece:																					
Athens and Piraeus	C		1	3	1										2	1					
	D				1										1						
Mitylene	C		1	5	1	1		2		1	1	1									
Patras	C		2	2	1		1														
	D				1		1														
Hawaii Territory: Hawaii	D		1																		
India	C	404	1,391	2,710	3,246	812	1,015	856	919	1,193	1,228	1,348	1,749								
	D	241	836	1,428	1,792	495	551	485	554	668	742	773	1,085								
Bombay	C	14	14	7	4										1						
	D	13	11	5	3										1		1				
Calcutta	C			18																	
	D			10																	
Madras Presidency	C	255	620	465	583	149	83	152	86	190	158	220	223	174							
	D	115	321	230	298	63	54	80	85	111	61	108	79	69							
Rangoon	C	21	15	6	11	5	2		4	5	2	6	2	2	4						
	D	20	14	6	11	5	2		4	5	2	5	3	2	3	7					
Indo-China: Saigon	C			2					1												
Senegal:																					
Baol	C	41	23	72	95				P		P										
	D	22	13	33	40																
Cayor	C	126	227	463	176	32	8	8	P												
	D	74	166	233	88	20	4	4													
Dakar	C	67	46	20	1																
	D	41	32	12																	
Louga	C			5	8																
	D			4																	
M'Bour	C	28																			
	D	23																			
Rufisque	C	104	44	16																	
	D	82	38	12																	
Thies	C	7		9	1	1															
	D	3		7																	
Tivaouane	C	43																			
	D	29																			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927				December, 1927					January, 1928				February, 1928	
							5	12	19	26	3	10	17	24	31	7	14	21	28	4	11
Siam	C				13					2			1	1	7						
	D				9		1			1			1	1	1						
Bangkok	C				2																
	D						1														
Straits Settlements: Singapore	C								1												
	D								1												
Turkey: Constantinople	C			1	1					1	1										
	D				1						1										
Union of South Africa:																					
Cape Province	C					2						2									
	D					2						1									
Orange Free State	C	4							1	8	P										
	D	4							1	6											
U. S. S. R.:																					
Chita District	C				1																
	D				1																
Northern Caucasus	C			14	1																
	D			10																	
On vessel:																					
At La Plata, from Rosario, Argentina	C														1						
S. S. Aghios Gerasimos at Vigo, Spain	C								3												

Indo-China (French), 3 cases, Dec. 11-20; Beirut, Syria, 1 case, Dec. 1-10.

Place		July	August	September	October	November	December
Algeria: Algiers	C				2		
British East Africa: Kenya	C	13	61	21	18	28	
Ecuador: Guayaquil	C	5	7	3	4	9	5
	D					3	2
Indo-China (French)	C			14	3	3	
Madagascar	C	46	98	170	166	209	
	D	43	89	154	155	189	
Ambositra Province	C	6	1		6		
	D	6	1		6		
Antisirabe Province	C		34	5	19		
	D		34	4	19		
Itasy Province	C	14	11	21	16		
	D	14	7	20	15		

Place		July	August	September	October	November	December
Madagascar—Continued.							
Moramanga Province	C	5	4	3	24		
	D	5	4	3	20		
Tananarive Province	C	21	48	142	99		
	D	19	43	127	93		
Mauritius	C			1			
Peru	C	8	11	15	14	6	14
	D	7	6	6	5	2	4
Callao	D	3					
Lima	D				1	1	1
Syria. Beirut	C			1	1		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927 5	12	19	26	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	Feb., 1928 4
Algeria	C			382	683		294	218	149											
Algiers	C												3	3	4			3		
Oran	C	14	9	16	11		10	4	6	9	11	10	9	8	15	2	4	2		
Arabia: Aden	C	2							1		1		1							
	D	1																		
Brazil:																				
Para	C		1																	
Rio de Janeiro	C	4	6	10		1														
	D	4	4	9		1														
British East Africa: Tanganyiki	D		21	8	P	P	P													
British South Africa:																				
Northern Rhodesia	C	48	55	39	164	150	10	22	3	57	15	125	55	2						
	D	2	1	2	11	40	23		1	18	7	28	9							
Southern Rhodesia	C								3				2	1						
Canada:																				
Alberta	C	42	17	17	23	6	2	1	1	7	3	3	6		3	3	5	1	19	1
Calgary	C	5	1																	
Edmonton	C				1	1				6		1	1			3	2	1		
British Columbia: Vancouver	C			2								4		1	3	3	1	11	3	1
Manitoba	C		13	9	7	3	14		2	1	3	1	2	2	2	2	5		1	
Winnipeg	C	3	5	4	2				2			1	1	1			1	1	1	
New Brunswick	C			2										1						
Nova Scotia	C			1	1															
Halifax	C				1															
Ontario	C	63	60	22	96	64	38	77	85	71	90	82	104		53	83	76	52	77	63
Hamilton	C										2									
Kingston	C								1					1						
Ottawa	C	37	27	40	67	47	17	51	19	10	19		34	18	9	20	23	20	16	23
Toronto	C	5		2	10	2	16	3	13		25	14		7		11	10	8	5	
Windsor	C				9															
Quebec	C	12	1		8	7	3	12	3	8	5	3		14	3	10	17	7		11
Montreal	C							1						1		1	6	3	4	1
Quebec	C								4		2		2		2		3		5	
Riviere du Loup	C								3											
Saskatchewan	C	25	14	68	31	5	12	2	14	9	15	19	15	12	18	15	12	39	15	9
Moose Jaw	C		10	16	3								1		1	2	1	4	2	3

Regina	C	2	8		5			1					1							
Saskatoon	C											2			4			13	1	
Ceylon: Colombo	C		1								1									
	D		1																	
China:																				
Antung	C	3															1			
Canton	C			1																
	D			1																
Chefoo	C			1	P					P										
	D			1																
Foochow	C	P	P	P	P		P			P										
Hong Kong	C	3	1	2													1			
	D	3	1	2																
Manchuria—																				
Changchun	C	4								1										
Dairen	C				1		2						1							
	D				1															
Fushun	C	1		1				1												
Harbin	C	1											2		1					
Mukden	C	3			2	1														
Pensihu	C	1			1															
Tientsin	C	11		4	13	8				4	1	2	2	2						
Curacao (Alastrim)	C																	2		
Dutch East Indies:																				
Borneo—																				
Samarinda District	C					P														
South and East Borneo Residency	C		P																	
Java:																				
Batavia and West Java	C	2	4		4			25												
	D							15												
East Java and Madura	C	8	4	22	8	1	3	5		4	3	2								
	D				1															
Sumatra: Medan	C		1										3		8					
	D												2		1					
Egypt	C	4		3							4									
	D			1	1							1								
Cairo	C										1									
Great Britain:																				
England and Wales	C	721	568	508	47[illegible]	199	219	258	226	233	306	230	212	255	247	275	398	405	370	
Birmingham	C		1		1													14	17	
Bradford	C					1	5	3	2	9	6	2	2	2	2	4	24	6	9	
Bristol	C				6	1			3	2	4	2							2	
Cardiff	C					1										1				
Leeds	C	2	5	3	7	1	1	1	2	3	3	6	4	4	6	1		1		
Liverpool	C																1			
London	C																	2		
Manchester	C				3		1	1	4	2	5	10	8		1	2	2	11	6	
Newcastle-upon-Tyne	C	1	1	2	6	2	6		1	23	18	5	4	2	13	2	5	14	3	
Nottingham	C															7	6	4		
Sheffield	C	11	2	1	10	4			2	1	8			3		1	10	4		
Stoke-on-Trent	C		1													3	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3–30, 1927	July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept 25–Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	Feb., 1928: 4
Greece: Saloniki	D	1	2																	
Guinea (French): Beyla	C	9																		
India	C	11,340	5,911	4,398	3,153	779	805	1,235	1,233	1,031	1,556	1,939	2,205							
	D	3,140	1,668	1,120	715	190	200	211	326	307	359	465	519							
Bombay	C	38	33	12	10	2			4				5		4	4	6			
	D	21	19	8	2	2			1				1							
Calcutta	C	93	27	22	5				5	4	3	11	7		17	9	14			
	D	70	25		6				2	2	1	6	2		17	4	6			
Madras	C	4	6	7	8	3		2	2	2	2	5	2	2		11	8			
	D	1		2		1		1		1	1	1		1		4	1			
Rangoon	C	37	14	9	17	4		1	1	5	2	1	6	36	28		49			
	D	11	3	2	3	1				1	1		2	5	13		9			
Vizagapatan	C	11		3												3		2		
	D	4		2														6		
India (French): Karikal	C	2	3	1	2		P													
	D	2	3	1	2															
Pondicherry	C	22	39	37	38							6								
	D	20	31	37	38							6								
Indo-China: Saigon	C	1	1	1									1		1		1			
Iraq: Baghdad	C			1	7			5		1	5	7	12	8	9		2			
	D			1	4			4			5	4	5	2	3					
Basra	C	1	1	4	2				3		2	2			2					
	D	1	1	4	2				1		2	1			1					
Italy: (Rome and vicinity)	C	1		1																
Jamaica (outside Kingston) (alastrim)	C	15	6	9	9	7				1		1	1		2				4	
Kingston	C			3	2															
Japan: Nagasaki	C	17	2																	
	D	5	1																	
Mexico: Acapulco	C			2				1												
	D			2				1												
Chihuahua	D															1				

Guadalajara	D									1			1							
Manzanillo	D																1			
Mexico City and surrounding territory	C									1	1	1	1							
Monterey	C	6																		
	D	4																		
San Luis Potosi	D	4	1																	
Torreon	D		1		2															
Palestine: Jerusalem	C										1									
Paraguay	D	2																		
Persia: Teheran	D	2																		
Poland	C	7	2										1							
	D	2	1																	
Portugal:																				
Lisbon	C	4		3	8	1	2		1		3	3	4	1	2	4	5			
	D												1							
Oporto	C			1																
Siam	C	34	51	27	6				1		8		1	2	5					
	D	9	10	15									1							
Bangkok	C	5		3					1		1				1					
	D	1		1																
Spain:																				
Malaga	D								1	1										
Seville	C																1			
Valencia	C				1										1	1				
Straits Settlements: Singapore	C							1												
Switzerland	C													2						
Tunisia: Tunis	C														1	2				
Union of South Africa:																				
Cape Province	C	P	P		P															
Orange Free State	C		P						P	P	P	P	P	P						
Transvaal	C				P	7														
Venezuela: Maracaibo	D	1		2	1															

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927		
						1-10	11-20	21-30	1-10	11-20	21-31
Algeria	C	376	459	382	682						
Oran	C	14	19	16	11						
Indo-China	C	19	3	21	25	13	3	22	10		
Syria:											
Aleppo	C										1
Beirut	C								1		1
Damascus	C		3	5	22		13		4	6	2

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July	August	September	October	November	December
Angola	C	42	2	5	73		
	D				2		
Congo	C			5	77		
Cuanza-Norte	C			1			
Cuanza-Sul	C				2		
Loanda	C			1			
Zaire	C			3	4	1	
Brazil: Porto Alegre	C	5	3	3	4	1	
British East Africa: Zanzibar	C				2		
	D				1		
Chosen	C	19	2			2	
	D	6				1	
Ecuador, Guayaquil	C		2	2	1	1	4
France	C	23	6	8	7	4	14
Gold Coast	C	1	1	5			
Greece	C	3	3	4	4		1
Latvia	C				2		
Mexico	D	93	73	55			
Morocco	C	53	76	51	81	401	
Nigeria	C	492	91	237			
	D	83	20	70			
Persia	D					2	
Spain: Madrid	D					1	
U. S. S. R.:							
Railways, etc	C	11	6				
Other territories in Europe	C	146	111				
Transcaucasus, Siberia, and Central Asia	C	36	29				
Ukraine	C	16	4				

TYPHUS FEVER

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21
Algeria: Oran	C													1	1	1		
Bulgaria: Sofia	C				17	3	1	2					1	1	4	1		1
	D						1											
Chile:																		
Antofagasta	D	1			1													
Talcahuano	D	1																
Valparaiso	C	2		1				1		1	1						1	
	D		2	1				1	1									
China:																		
Manchuria—Harbin	C	3	2				[illegible]	1										
Tientsin	C	1		2														

[illegible]	C	[illegible]	[illegible]		[illegible]		[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
	D	1	3		5						5	1	2					
Port Said	C				1						1							
Ireland (Irish Free State):																		
Cork County	C	1										3				1		
Donegal County, Letterkenny	C				4													
Mexico:																		
Guadalajara	D									1								
Mexico City, including municipalities in Federal District	C	16	17	19	18	9	6	2	11	7	6	4		4	4	4	3	
	D						2						1	1	3	1		
Palestine:																		
Haifa	C		4		2				1	1								
Herzlia	C									1								
Jaffa	C		2		1					1								
Nazareth	C	1	2						1									
Safad	C	1	2							1		1						
Tel-Aviv	C		1	1	2				1	1	1							
Poland	C	99	50	35	19	35	12	6	11	13	28	17	35	26	33	68		
	D	10	6	2	4	6	3		2	1	5		4	1	3	6		
Portugal: Oporto	C		1			1								1				
Rumania	C	27	36	16	17				2	6	8	8						
	D	4	1		2													
Syria: Aleppo	C			2												2		
Tunisia	C	29	14	1	3			1					1	1			5	
Union of South Africa:																		
Cape Province	C	P	P	P	P		P	P	P	P	P	P	P	P	1			
Natal	C	P	P	P	P		P	P	P	P	P	1	P	2	P			
Orange Free State	C	P			P							P						
Transvaal	C	18	1		5		P	P	P	P	P							

Place		1927				November, 1927			December, 1927			January, 1928
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10
Algeria	C	67	33	10	12							
	D	13			1							
Algiers	C	2	2	6	2							
Bulgaria	C	12	24	7	2							
	D		1	2	1							
Morocco	C	148	76	7	11	5	14	7	5	6	75	107
	D											

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		July	August	September	October	November	December
Argentina	C					1	
Chosen	C	72	17	1	16	26	
	D	8			1	2	
Chemulpo	C	1	2				
Gensan	C	2					
Seoul	C	2	3		2		
	D	1			1		
Czechoslovakia	C	6					
Greece: Athens	C	1		2			1
Japan	C	1					
Latvia	C	6					
Lithuania	C	44	18	7	9	18	
	D	5	8	1	1	1	

Place		July	August	September	October	November	December
Mexico	D	12	38	14			
Peru:							
Arequipa	D		2	1	2		
Lima	D	8					
U. S. S. R.:							
Railways, etc.	C	30	22	25	23		
Transcaucasus, Siberia, and Central Asia	C	79	69	60	61		
Ukraine	C	96	85	114			
Other territories in Europe	C	732	552	555			
Yugoslavia	C	11	9		1	1	
	D	4	1				

YELLOW FEVER

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	Jan. 7, 1928
Belgian Kongo: Boma and Matadi	C														7	
Ashanti: Obuasi	C		1													
	D		1													
Dahomey:																
Grand Popo	C									1						
	D									1						
Porto Novo	C	1														
	D	1														
Ivory Coast	C	1												1		
	D	1												1		
Liberia: Monrovia	C			1												
Nigeria	C			2												
	D			2												

Senegal	C	3	10	21	31	9	16	6	7							
	D	3	9	21	31	8	10	4	6							
Dakar	C	1			12	3	6		5	2	1	4			1	1
	D				7	2	4		4	2	1	4			1	1
Geoul	C				1											
	D				1											
Goree Island	C			2												
	D			2												
Kebemer	C				2											
	D				2											
Kelle	C				2	1										
	D				1	1										
Keur Samba Kane	C					1	1									
	D						1									
Keur Madiop	C					1										
	D					1										
Khombole	C		3		3				1							
	D				3				1							
Louga	C				1	2	1	1								
	D				1	2	1	1								
Mekhe	C				1	1	2	2								
	D					1	1	1								
M'Dande	C				1		2	1								
	D				1		1									
Ouakham	C	2	2													
	D		1													
Pout	C			1												
	D			1												
Rufisque	C				1											
	D				1											
Saint Louis	C		2		1											
	D		2		1											
Sebikotane	C				1		2	1								
	D				1			1								
Thies	C	1		3	8	1	2	1	1							
	D	1		3	8	1	2	1	1							
Tiaroye	C			1												
	D			1												
Tivaouane	C			1												
Togoland	C		1													
	D		1													

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

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ISSUED WEEKLY

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SPECIAL ARTICLES

Infant and Maternal Mortality in the United States

Malta Fever A Problem for State and Municipal Laboratories

UNITED STATES
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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

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PUBLIC HEALTH REPORTS

VOL. 43 MARCH 2, 1928 NO. 9

INFANT AND MATERNAL MORTALITY IN THE UNITED STATES

By E. BLANCHE STERLING, *Acting Assistant Surgeon, United States Public Health Service*

INFANT MORTALITY

The accompanying graphs show the downward trend in infant mortality during the 10 years from 1915 to 1924. The provisional figures for 1925 and 1926 show a slight rise; but in view of the fluctuations shown in the curves this is probably not significant. In the period for 1915 to 1924, for which we have complete data for the white and colored races in both rural and urban areas, it will be seen from the table and graphs that there was a decrease of 29 per cent in the total infant mortality rate in the registration area. The decreases in the rates for the urban and rural areas were very similar—30 per cent for the urban and 27 per cent for the rural. The improvements in the rate for white infants in the total registration area, in the urban area, and in the rural area are strikingly similar—32 per cent, 32 per cent, and 31 per cent, respectively.

With the exception of urban areas, the rate for colored infants has decreased to a greater extent than has that for white infants. The improvement in rural areas is striking. The mortality rate among colored babies in the country has decreased 42 per cent in the decade under consideration. This is interesting in view of the fact that undoubtedly no class of the infant population has been less affected by so-called infant welfare work. It apparently behooves us to learn what is lacking in our present methods, or, to be more fundamental, what are the most important causes of infant mortality. It may be that we are spending our ammunition on snipers while the heavy battalions of the enemy are mowing down our lines.

It is doubtless true that improper feeding is responsible for a part of the infant mortality. The studies of the United States Public Health Service in the use of dried-milk powder in infant feeding pointed the way to a possible lowering of infant mortality from intestinal causes by a wider use of this product in localities where pure fresh milk is not available.

A very large proportion of the total infant mortality takes place within the first month of life. The Public Health Service has recently

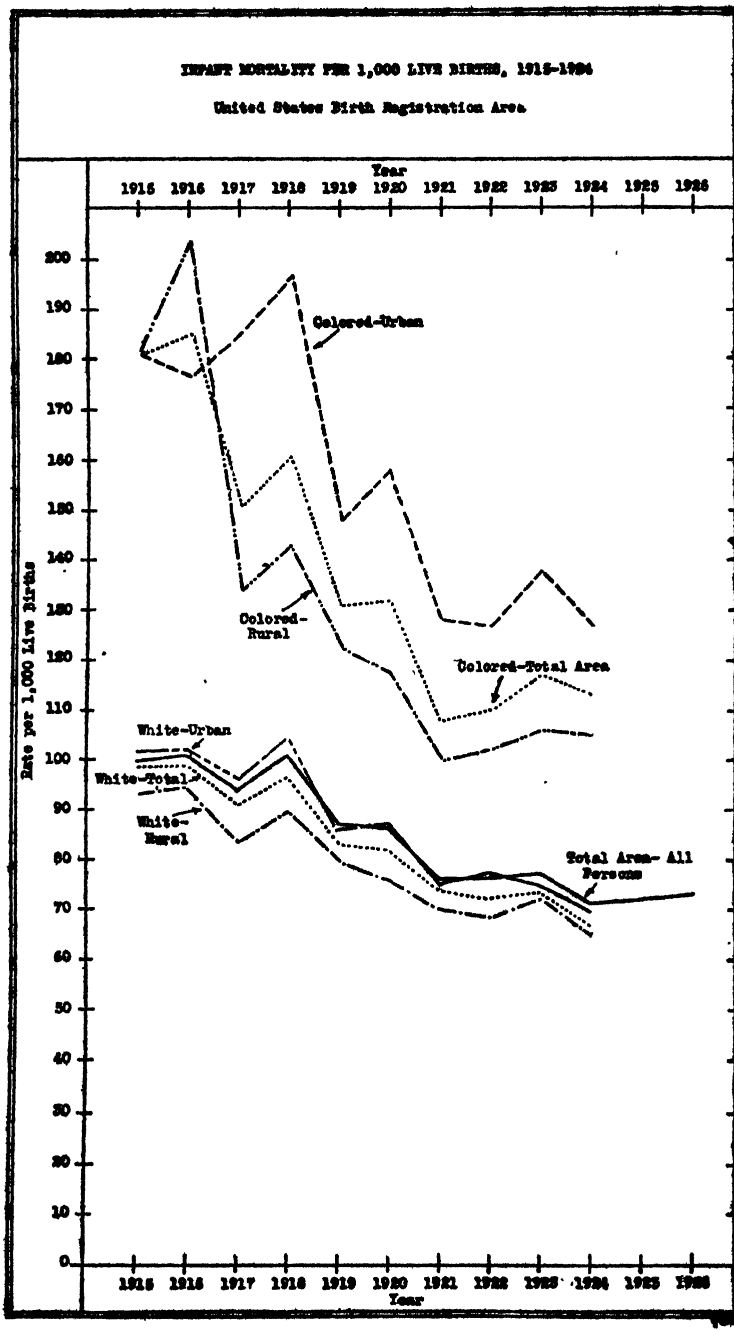
INFANT MORTALITY PER 1,000 LIVE BIRTHS, 1915-1924
United States Birth Registration Area
Year
1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926
Rate per 1,000 Live Births
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Colored-Urban
Colored-Rural
Colored-Total Area
White-Urban
White-Total
White-Rural
Total Area- All Persons
1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926
Year

FIG. 1

issued a statistical study of the problem of fetal and neonatal death which sums up our present knowledge of the subject.[1] This study emphasizes the need of further research.

TABLE 1.—*Infant mortality: Death rates per 1,000 live births*

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	Provisional, 1926
Total	100	101	94	101	87	86	76	76	77	71	72	73
White	99	99	91	97	83	82	72	73	73	67		
Colored	181	185	151	161	131	132	108	110	117	113		
Urban	103	104	100	108	89	91	78	80	78	72		
White	102	102	96	105	86	87	75	77	75	69		
Colored	181	177	185	197	148	158	128	127	138	127		
Rural	94	97	88	94	84	81	74	72	76	69		
White	94	95	84	90	80	76	70	69	72	65		
Colored	182	203	134	143	123	118	100	102	106	105		

MATERNAL MORTALITY

Unfortunately the United States can not show a downward trend in maternal mortality. In fact, the accompanying tables and graphs show a rise of 8 per cent in maternal mortality from all puerperal causes in the total registration area from 1915 to 1924. In urban areas there has been a rise of 14 per cent—from 6.4 to 7.3 per 1,000 live births. The rural areas show an increase of 5 per cent. The only decrease shown in the maternal mortality from all puerperal causes is in the rate for white mothers in rural sections, which has fallen from 5.5 to 5.1—a decrease of 7 per cent. In the total registration area the rise in the rate for whites is very slight—less than 2 per cent—but in urban areas alone the rise has been 11 per cent.

TABLE 2.—*Maternal mortality: Death rates per 1,000 live births from all puerperal causes*

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
All puerperal causes:										
Total	6.1	6.2	6.6	9.2	7.4	8.0	6.8	6.6	6.7	6.6
White	6.0	6.1	6.3	8.9	7.0	7.6	6.4	6.3	6.3	6.1
Colored	10.6	11.8	11.8	13.9	12.4	12.8	10.8	10.7	10.9	11.8
Urban:										
Total	6.4	6.5	7.0	9.6	7.9	8.6	7.7	7.3	7.4	7.8
White	6.3	6.3	6.7	9.3	7.6	8.2	7.4	7.0	7.1	7.0
Colored	11.0	12.8	13.8	16.7	13.9	15.1	13.1	12.4	12.3	12.9
Rural:										
Total	5.5	5.7	6.2	8.7	6.9	7.4	5.9	5.9	5.9	5.8
White	5.5	5.7	5.9	8.4	6.3	6.9	5.4	5.5	5.3	5.1
Colored	8.3	9.7	10.8	12.5	11.8	11.7	9.7	9.8	10.2	11.1

[1] The Problem of Fetal and Neonatal Death. By E. Blanche Sterling. PUB. HEALTH REP., vol. 42, No. 11 (Mar. 18, 1927), pp. 717–751. Reprint No. 1146.

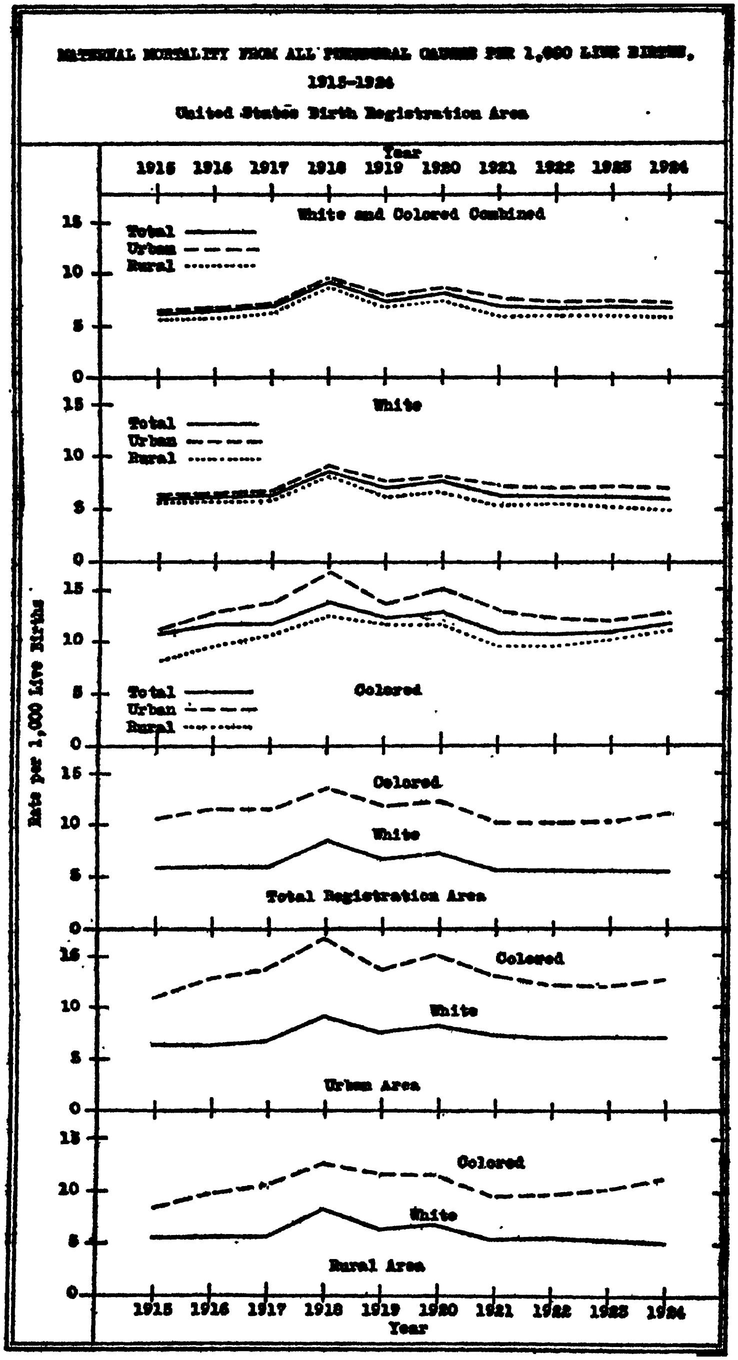
United States Birth Registration Area
Year
1915 1916 1917 1918 1919 1920 1921 1922 1923 1924
White and Colored Combined
Total
Urban
Rural
White
Colored
Total Registration Area
Urban Area
Rural Area
Rate per 1,000 Live Births
0
5
10
15

Fig. 2

TABLE 3.—*Maternal mortality: Death rates per 1,000 live births from puerperal septicemia*

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
Total	2.4	2.5	2.7	2.5	2.5	2.7	2.7	2.4	2.5	2.4
White	2.3	2.5	2.6	2.4	2.3	2.6	2.6	2.3	2.4	2.3
Colored	5.2	5.2	4.8	4.3	4.1	4.0	3.9	3.9	3.8	4.0
Urban:										
Total	2.7	2.9	3.2	2.9	2.9	3.2	3.3	2.8	3.1	2.9
White	2.6	2.8	3.0	2.8	2.8	3.0	3.2	2.7	2.9	2.8
Colored	5.7	6.3	6.9	6.6	5.8	6.2	5.7	5.3	5.6	5.2
Rural:										
Total	1.9	1.9	2.3	2.2	2.0	2.2	2.1	1.9	1.9	1.9
White	1.9	1.9	2.2	2.1	1.8	2.1	2.0	1.8	1.8	1.7
Colored	2.9	2.8	3.7	3.1	3.3	2.9	3.1	3.2	2.9	3.3

TABLE 4.—*Maternal mortality: Death rates per 1,000 live births from puerperal causes other than puerperal septicemia*

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
Other puerperal causes:										
Total	3.7	3.7	3.9	6.6	4.9	5.3	4.1	4.2	4.1	4.1
White	3.7	3.6	3.7	6.4	4.6	5.0	3.8	4.0	3.9	3.8
Colored	5.3	6.6	7.0	9.6	8.4	8.8	6.9	6.8	7.1	7.8
Urban:										
Total	3.7	3.6	3.8	6.7	4.9	5.4	4.4	4.5	4.3	4.4
White	3.7	3.6	3.7	6.6	4.8	5.2	4.2	4.3	4.2	4.2
Colored	5.3	6.4	6.9	10.1	8.1	8.9	7.4	7.1	6.7	7.7
Rural:										
Total	3.6	3.8	3.9	6.5	4.9	5.2	3.8	4.0	4.0	3.8
White	3.6	3.7	3.7	6.3	4.5	4.8	3.4	3.7	3.5	3.4
Colored	5.4	6.9	7.0	9.4	8.5	8.8	6.6	6.6	7.3	7.8

TABLE 5.—*Maternal mortality: Death rates per 100,000 estimated population*

Cause	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
Accidents of pregnancy	1.4	1.4	1.4	5.2	2.5	2.7	1.4	1.5	1.6	1.4
Puerperal hemorrhage	1.5	1.6	1.6	1.5	1.4	1.6	1.7	1.5	1.5	1.5
Other accidents of labor	1.5	1.7	1.6	4.1	2.5	2.6	1.7	1.9	1.8	1.7
Albuminuria and convulsions	4.0	4.3	4.5	4.5	4.2	4.9	4.5	4.3	4.1	4.3
Puerperal septicemia	6.3	6.7	7.0	6.5	5.8	6.6	6.8	5.7	5.8	5.8

A study of the rates for colored mothers shows increases in the total registration area, in the urban, and in the rural area, of 11 per cent, 17 per cent, and 34 per cent, respectively.

A study of Tables 2, 3, and 4 shows that of the maternal mortality due to all puerperal causes in 1924 in the total registration area, that due to puerperal septicemia comprised over 36 per cent of the total, and more than 58 per cent of that due to all other puerperal causes. This appears to be the greatest single cause of puerperal mortality, but Table 3 does not indicate that this cause accounts for the slight rising trend of maternal mortality. Though there is a slight increase from this cause in the total urban rate and in the rates of white city women and colored country women, in every other instance the rates show a tendency either to fall or to remain more or less stationary.

It is possible that an examination of other causes of puerperal mortality may shed some light on the question. Data for the rates per 1,000 live births for the specific causes of puerperal mortality are not available, but the death rates per 100,000 estimated population from these specific causes are shown in Table 5. These include the more important causes of puerperal mortality and cover the same period under consideration, 1915–1924.

In two of these causes—other accidents of labor (puerperal hemorrhage having been eliminated) and albuminuria and convulsions—

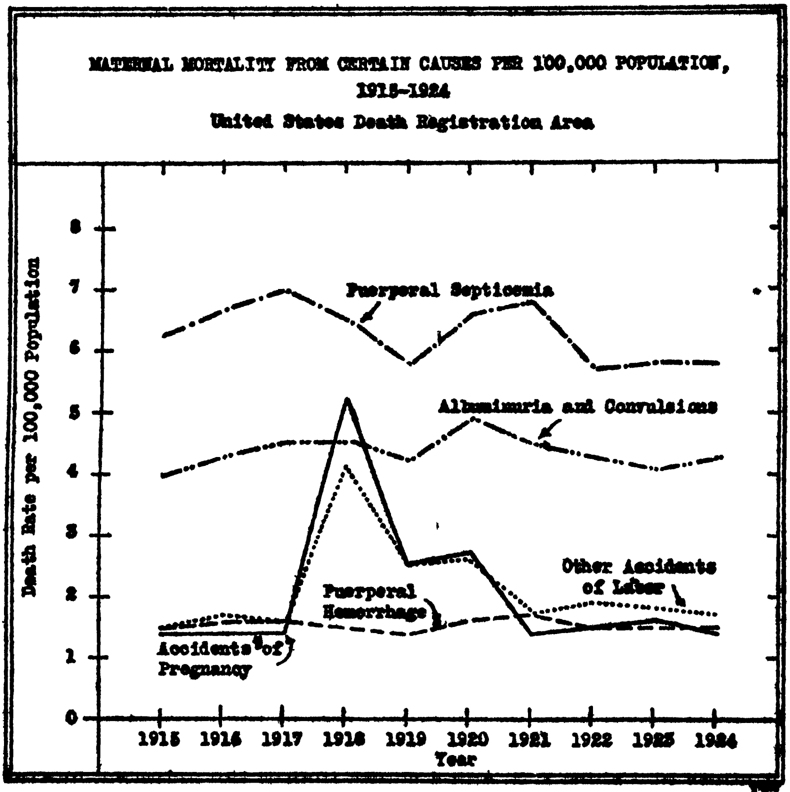

FIG. 3

there seems to be a slight rising tendency. The rate for the former has risen 13.3 per cent and for the latter more than 7.5 per cent. The indications are that the more careful management of normal labor and its complications should be emphasized in any endeavor to reduce the death rate from puerperal causes.

BIRTH AND DEATH REGISTRATION

There continues to be a gradual expansion of the birth and death registration areas, and the birth registration area has almost caught up with the death registration area. There are now 42 States, the

District of Columbia, and 21 registration cities in nonregistration States in the death registration area. This includes 91.3 per cent of the total population of the United States. Of the remaining 6 States, 4 have good registration laws which have not been in force long enough to bring registration up to 90 per cent, as required for acceptance into the registration area, and 2 have unsatisfactory laws which can not secure good registration.

In the birth registration area there are 40 States and the District of Columbia, which, together, include 87.3 per cent of the total population of the country. Six other States have good laws which are yet too new to have brought the registration of births up to the required 90 per cent. Two States have unsatisfactory laws. Considerable progress was made in stimulating both death and birth registration during 1927, one State having been added to the death registration area and five States to the birth registration area. The Bureau of the Census is carrying on a special campaign looking toward the inclusion of every State in the registration area before 1930.

MALTA FEVER: A PROBLEM FOR STATE AND MUNICIPAL LABORATORIES

By A. V. Hardy, M. B. (Tor.), *Acting Assistant Surgeon, United States Public Health Service, Iowa State Epidemiologist, Acting Director Iowa State Laboratories*

There is, at present, a growing interest in Malta fever. This began in 1924, when Keefer (1) published the report of a case due to *Br. melitensis* var. *abortus*. The previous work of Evans (2), who established the close relationship between the *Br. melitensis* of Malta fever and the organism of contagious abortion of cattle, suggested this possibility. Much work has since been done in the attempt to prove the source of the few scattered human cases which have been diagnosed in this country, and different conclusions have been reached. The prevalence of contagious abortion in cattle and the apparent infrequence of Malta fever has caused some investigators to question the etiological relation of the former to the latter. Others, however, agree with Huddleson (3) who suggested that there have been, and now may be, many cases of this disease which are not diagnosed. The lack of pathognomonic symptoms or signs makes this probable. The findings of Hull and Black (4), Orr and Huddleson (5), and our own, support this opinion. It is urged by See (6) that the disease simulates typhoid, paratyphoid, influenza, acute articular rheumatism, tuberculosis and certain forms of malaria. Because this is true, Evans (7) has pointed out that "there is no disease in which the physician is more dependent upon laboratory findings for a correct

diagnosis," and has also advised that more examinations for Malta fever be done.

The State and municipal laboratories have an unusual opportunity to contribute to the study of Malta fever. Blood will be received from a large proportion of patients with a prolonged undiagnosed fever. At the present time, few general practitioners think of the possibility of meeting Malta fever, but typhoid or paratyphoid will be considered. Having these in mind, blood will be sent for a Widal test. Our findings indicate that in all such cases an examination for Malta fever should be done. The laboratory should take the lead here and investigate in a direction not requested by the physician. Only when the disease becomes generally known and clinically suspected should the laboratory worker wait for the physicians to request the examination.

In tabular form the findings for six months at the Iowa State Laboratory are summarized. During this period, blood specimens sent for Widal tests were examined for Malta fever. The difference in the number of tests which were made during the first three months and the last three months demands explanation. Eighty per cent of the specimens received are dried blood. During the first three months only wet blood specimens were tested for Malta fever. The probability of detecting additional cases through the examination of dried blood suggested itself, and this was started early in September. On the first day that this was done, one specimen gave a marked agglutination of the organisms, so the procedure has since been adopted as a routine. The technique and the interpretation of the tests will be discussed in a later part of the paper.

Results of blood examinations for Malta fever at the Iowa State Laboratory during a six-month period

Month	Agglutination tests for Malta fever	Positive agglutination tests	Positive cases	Confirmed positive cases	Unconfirmed positive cases
June	32	4	3	2	1
July	27	5	2	2	0
August	37	3	2	2	0
September	211	22	8	6	2
October	256	15	12	10	2
November	220	19	11	9	2
Total	783	68	38	31	7

In the second column of the table the total number of positive agglutinations reported is indicated. The difference between these numbers and the total number of positive cases is explained largely by the repetition of examinations on the various cases. In September, however, five dry blood specimens were recorded as weakly positive, but the wet blood specimens from these patients proved to be nega-

tive. These had been reported without titration by the method which will be described. The specimens were kept, however, and later, in October, the titer was determined and they were found to fall into the class now reported as negative.

The positive cases are divided into two groups—confirmed positives and unconfirmed positives. In many of the cases, the agglutination of *Br. melitensis* has suggested the diagnosis of Malta fever. On this basis alone, however, the diagnosis is not established. Clinical evidence pointing to Malta fever and laboratory and clinical evidence ruling out the diseases with which it may be confused, combined with the laboratory evidence of the infection, are considered as sufficient to confirm the diagnosis. The clinical findings were personally determined in 21 cases. This was done during an epidemiological investigation. In 20 of these, the clinical findings justified the classification of the case as a confirmed positive. The one regarded as an unconfirmed positive had an advanced carcinoma, but with a persistent low-grade fever. The latter may have been due to *Br. melitensis*, but the agglutination titer was never higher than 1:160, and two cultures proved to be negative. Of the remaining 11 confirmed positive cases, 2 were studied in the University of Iowa Hospital and the organisms were repeatedly isolated. On seven, two or more agglutination tests were done and in addition a clinical report has been sent by the physician. A recent case with a high titer is included on the basis of laboratory evidence alone. One case, on which the agglutination test on the dried blood only was done, is considered as confirmed, since the clinical signs, symptoms, and course all indicated Malta fever. A wet blood specimen could not be obtained from the patient

All positive serums have been tested with five organisms: *Br. melitensis*, var. *melitensis; Br. melitensis* var. *abortus; B. typhosus; B. paratyphosus* A; and *B. paratyphosus* B. Serums from 21 of the confirmed positive cases were tested with *B. tularense*. In all cases there was no agglutination of typhoid or paratyphoid organisms. In one case, *B. tularense* agglutinated in the 1:20 dilution and slightly in 1:40, but not higher. With *Br. melitensis* var. *melitensis* and var. *abortus*, there have been almost corresponding results in the titer obtained. With these organisms in 11 of the confirmed cases a titer of 1:1,280 was obtained; in four 1:640; in ten 1:320; in three 1:160, and in two 1:80. The reaction is called positive if there is a precipitation of 75 per cent or more of the antigen.

The unconfirmed positive cases are largely so classed because they have not been sufficiently studied. Serums from the one case in June and the two cases in September were examined both by us and at the Hygienic Laboratory, in Washington, D. C. Two gave a titer of 1:640 and one 1:80. No clinical history is known, however, but

these are probably Malta fever. The remaining four cases include two on which only positive dry blood specimens have been received, one on which the serum titer was 1:80, and the carcinoma case, previously mentioned.

ROUTINE MACROSCOPIC TEST

Many, if not most, of the public health laboratories are understaffed. Already there is a burden of work for each person. To be applicable, therefore, any additional routine tests must be simplified as far as is compatible with the obtaining of accurate results. It should be remembered, however, that very valuable contributions to our present knowledge of Malta fever may be made by standardized routine work. It is evident that to examine all specimens, a rapid method must be used; but a careful study should be made of all suspicious or positive specimens. To meet these requirements, the procedure described below has been found satisfactory.

In the preparation of antigen for routine work we have used an *abortus* strain supplied by the Hygienic Laboratory at Washington, and known as No. 456. We follow essentially the procedure described by Evans (7). From the stored supply a dilution is made to compare with the opacity standard of 1,000 p. p. m. For the preliminary examination of all specimens this antigen is diluted with equal parts of saline. This gives a suspension of 500 p. p. m. The serum is then diluted directly in the antigen. For each test, 5 tubes, 11 by 90 millimeters, are used. The serum dilutions are 1:5, 1:10, 1:20, 1:40, and 1:80. Three tubes only would be satisfactory, using the 1:20, 1:40, and 1:80 dilutions, but the five are used in order to collect data on the agglutination in low titers. A final volume of 0.4 c.c. is satisfactory and has the advantage of using less antigen. The dilutions are made as would ordinarily be done in saline. The method followed in this laboratory is to pipette the diluted antigen, using a 5 c. c. pipette graduated in 0.1 c. c. To the tubes in order 0.8, 0.4, 0.4, 0.4, and 0.2 c. c. are added. Using these amounts there is sufficient antigen in the 5 c. c. for two tests. Using a 1 c. c. pipette graduated in 0.01 c. c. to the first tube 0.2 c. c. of serum is added, giving the 1:5 dilution. From this tube 0.4 c. c. will be transferred to the second tube, giving the 1:10, and in a similar manner the 1:20 and the 1:40 dilutions are obtained. Of the 0.4 c. c. withdrawn from tube four, only 0.2 c. c. is added to tube five, giving the 1:80 dilution. The remaining 0.2 c. c. withdrawn is discarded. After the dilutions are thus set up, the racks are mechanically shaken for five minutes. They are then transferred to the 37° water bath and left for four hours. After this they are removed to the cold room and readings are made the following morning. In this preliminary test,

if there is agglutination in a titer of less than 1:40, a negative report is usually made, but with the suggestion that the examination be repeated if the fever continues. Only to hospitals or clinics in which a bacteriological study would be possible are agglutinations of 1:10 and 1:20 reported. It is indicated in the report that this titer has probably no diagnostic significance; but since positive cultures have been reported from such cases, it is suggested that cultures be taken. All serums which show complete agglutination in 1:40 and complete or partial in 1:80 are retitered before the report is made.

Before the final titration, serums are inactivated at 56° for 30 minutes. This should always be done if the 37° bath is used in the test. Three serums have been found by us which gave agglutinations up to 1:80 in the preliminary test, but which reduced to a titer so low as to be of no diagnostic importance after inactivation. Occasionally, therefore, misleading reports would be made if this step were omitted. In this titration, serums are first diluted in saline and the 1,000 p. p. m. antigen is added. As a matter of study, testing with both *abortus* and *melitensis* antigens is here recommended, though for diagnostic purposes only, either would be satisfactory. The shaking, incubation, and reading are done as described for the routine tests.

Of first importance in the interpretation of the macroscopic test is a knowledge of the lowest diagnostic titer. In order to determine this, a study of serums sent for Wassermanns has been started. At present, 287 tests have been done; but of all, 49 per cent gave complete agglutination in 1:5, 30 per cent in 1:10, 9.8 per cent in 1:20, 1.4 per cent as high as 1:40, and one specimen, or 0.3 per cent, had complete agglutination in 1:80 and partial in 1:160. Further work is being done to verify these results and to explain the phenomenon. The results suggest, however, that agglutination in a titer of less than 1:80 has little diagnostic value, and both the laboratory worker and the physician would be well advised to be slow in making a diagnosis of the infection because of agglutination in a low titer.

In the reporting of laboratory findings it must be borne in mind that some practitioners will accept any unqualified positive report as conclusive evidence of the presence of a disease. Until, therefore, more is known of the significance of agglutination in different titers, a letter should be sent with a positive report. This should urge that a diagnosis of Malta fever be made only if clinical and laboratory findings agree. The laboratory may assist in the differential diagnosis by reporting on typhoid, paratyphoid, and tularaemia; but the clinician must rule out an incipient tuberculosis, influenza, and, in some districts, malaria. If a titer of 1 : 80 only has been obtained, additional caution should be urged, though it may be pointed out that a diagnosis of the infection may safely be made if the clinical findings strongly support the laboratory suspicion. In the letter

giving a positive report, it is well to suggest that blood counts and cultures would be helpful, and in most instances it is appropriate to request that full clinical notes be kept. At this time also the epidemiological investigation may be mentioned; and for its success, the physician's interest and cooperation should be invited. Through such a personal letter with the report, a real cooperation may be enlisted.

MICROSCOPIC AGGLUTINATION TESTS

In the microscopic, as in the macroscopic test, two methods are employed. The first is simple and rapid and made on all dry specimens to separate the negative from the suspicious specimens. A titration on the latter is done before the final report is made. For all microscopic tests an antigen of 1,000 p. p. m. is used. In the first test a part of the dried blood is dissolved in a small drop of saline. Using a loop, the blood is mixed with the saline until the color of a drop in the loop compares with that of pale vaseline. This will give a final dilution of approximately 1 : 40. Care is necessary if errors are to be avoided, but an experienced worker can do this test with sufficient accuracy to separate negatives from the suspicious or positive specimens. The hanging drop is prepared in the usual manner and incubated for one hour. In this time there seems to be as much clumping as takes place in four hours, and tests are much easier to read after one hour than after four hours. Following a long incubation there is usually a precipitation of moisture around the hanging drop and this makes the reading difficult. In this preliminary examination any clumping is considered as suspicious, and on all of these a titration is done. The remainder are reported as showing no agglutination.

In the titration of dry bloods the dilution must be made on the basis of a color comparison. The method used is a modification of that described by Wadsworth (8). In this laboratory 0.02 c. c. of the defibrinated sheep blood is used, and, after drying, is diluted with 0.18 c. c. of saline. This gives the 1:10 color standard. This standard is then diluted to give the 1:20, 1:40, and 1:80 colors. In making this dilution, a Pasteur pipette is used. With this pipette held at a constant angle, two drops of saline are delivered into each of three depressions in the porcelain plate. The pipette is then blown dry. Two drops of the 1:10 standard are transferred to the second depression, giving the 1:20 dilution. In a similar way the 1:40 and 1:80 standards are obtained. A fresh specimen is also diluted, using the same procedure. This is necessary, since the old dry blood presents a much darker and browner appearance. With the two standards, however, a fairly accurate comparison of colors may be made. Following this procedure there will be equal volumes

in the 1:20, 1:40, and 1:80 dilutions, and a color comparison is, for this reason, easily made.

The dry blood to be titered is dissolved with saline. This should be added ten minutes or more before the titration is to be made. A volume estimated as sufficient to give a dilution of approximately 1:10 is used. Care should be taken not to add enough to give a dilution higher than this. Additional saline may be added in the porcelain diluting plate until the color compares with the standard. Dilutions are made in the same manner as that described for the standard. Dilutions up to 1:160 should always be made, but we have found it interesting to titer up to 1:1280. The result of the titration of positive serums and the positive dry bloods which have been obtained from the same patient may then be compared. This knowledge will be of value in interpreting the results of the dry blood examinations. In making the test, the hanging drops are prepared in the usual way. A loopful of the dissolved blood is mixed with a loopful of antigen. The lowest dilution set up will therefore be 1:20.

In reading, after the controls have been observed, the presence or absence of clumping in the test drops is noted. If this is present, the size of the clump is observed and recorded as small, medium, or large. The presence or absence of free organisms should also be noted. If there is any uncertainty, high power observations should be made. There are many possible errors in the interpretation of a microscopic agglutination test done on a small nonmotile organism. Great caution should therefore be used. At the present time we consider it unwise to make an unqualified positive report. The physicians are informed, by letter, of the significant findings, but we indicate that there has not been sufficient experience with the test to learn its reliability. We request that, in order to confirm the report, wet blood be sent for the macroscopic test. This is almost invariably done. If the agglutination tests on the dried blood are made, it is important that the laboratory have a standard which will allow a classification of the tests as negative, doubtful, or positive. This standard adopted at present may be changed after more experience. Through an examination of the dried smears made from the whole wet bloods received, the serum titers of which have been determined, we have fixed a standard satisfactory as a working basis. Tests which show small clumps in the lowest dilution with no agglutination in the higher are regarded as negative. This will be obtained when the serum gives complete or partial agglutination in a 1:20 dilution. Those showing medium or large clumps in the 1:20 and 1:40 dilutions, with small clumps and some free organisms in 1:80 or up to 1:160, are regarded as suspicious and should be reported; but if there are medium and large clumps in 1:40 and 1:80, with large, medium, or small clumps, but complete agglutination in 1:160, it may be expected that the case will prove to be Malta fever. At the

present time, however, as has been indicated, a final opinion should not be based on an examination of the dried blood only, but this standard may be used as a basis for further study and will prevent the giving of misleading information to the physicians.

DISCUSSION

The findings made at the Iowa State Hygienic Laboratories as a result of the routine examination for Malta fever of blood specimens sent for Widal tests have been reported. The significance of these examinations is better realized when compared with the results of typhoid examinations. During the three months, 46 positive Widals were reported from 41 cases, while the number of agglutinations for Malta fever was 56 from 31 cases. The figures indicate that, in Iowa at least, Malta fever presents a health problem comparable to that of typhoid.

The advisability of adopting the routine described in all State and municipal laboratories is emphasized by this report. Of the 38 positive cases, in only 10 did the physician consider Malta fever as a possibility and request the agglutination test. This condition continued even though a case was reported and discussed at the meeting of the State medical society in June, 1927, and the report later appeared in the Journal of the Iowa State Medical Society. The laboratory has also at different times, through brief laboratory notes which are inclosed with reports, called the attention of the physicians to the possibility of encountering Malta fever. Many physicians, therefore, have been looking for the disease. Even after this, in not one-fourth of detected cases had any examination for Malta fever been requested by the physician. The State and municipal laboratories should, therefore, make this examination as a routine. The advisability of testing the dried bloods may also be urged. In the three months in which this has been done, 30 positive cases have been found. Of these, 19 were first detected through the examination of the dried blood sent for a Widal test.

In Iowa, and the same is probably true of most States, many bloods are examined at hospital and private laboratories. For study we have requested that these be sent to the State Laboratory for Malta fever examination only. This has resulted up to the present in the finding of four cases. It seems advisable at the present time to have all examinations for this infection done at central laboratories. Cases may then be studied more fully and accurately.

The diagnosing of a greater proportion of the cases of Malta fever which actually occur may modify the present conception of its clinical course. In the past, only the unusually severe and prolonged cases have been studied. Those which were milder and shorter did not call forth the additional thought and action which might have led to the correct diagnosis. It may become clear,

therefore, that many mild and comparatively short illnesses are due to *Br. melitensis.*

Malta fever is probably a disease of the country, villages, and small towns. Most cases will, therefore, be seen by the general practitioners. Their laboratory in Iowa is the State laboratory, and a similar situation probably exists in most States. To obtain their interest in the infection, the most effective means will be to suggest and confirm the diagnosis of Malta fever on cases in which this disease was not clinically considered. This will be done only when bloods sent for Widal tests are routinely tested with *Br. melitensis.*

The distribution of the infection is as yet unknown. This information might soon be gathered by a united interest and effort taken by State and municipal laboratories. Negative findings will be as valuable as positive. A correlation of the distribution of Malta fever with that of contagious abortion will provide important information in the epidemiology of the disease. In addition, preventive measures will be taken only when its prevalence is known. This situation demands the diagnosis of the cases, and unless the laboratory takes the lead, this will rarely be made. The opportunity of contributing to the present knowledge of Malta fever, and of aiding in its control, is therefore apparent.

CONCLUSIONS

1. An examination for Malta fever should be done routinely on all blood specimens sent to State or municipal laboratories for Widal tests.
2. A rapid and preliminary test may be made to eliminate the negatives, but a careful study should be made on all doubtful and positive specimens.
3. Dried blood specimens as well as serums should be examined. The procedure for this test is described.
4. A diagnosis should be established only if clinical and laboratory findings agree.
5. Malta fever in Iowa presents a health hazard comparable to that of typhoid.
6. State and municipal laboratories have an unusual opportunity in contributing to the study of Malta fever.

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(5) Orr and Huddleson: Am. J. P. H. (December, 1927), vol. 17, pp. 1242–47.
(6) See: Medicine (December, 1924), vol. 6, pp. 213–218.
(7) Evans: Am. J. P. H. (April, 1927), vol. 17, pp. 399–403.
(8) Wadsworth: Standard Methods, p. 170.

SECOND INTERNATIONAL CONGRESS OF RADIOLOGY

To Be Held in Stockholm, Sweden, July 23–27, 1928

The attention of persons and institutions interested is invited to the Second International Congress of Radiology which will be held in Stockholm, Sweden, from July 23 to 27, 1928.

According to a memorandum furnished by the Minister of Sweden, through the Department of State, the proceedings will comprise Röntgen diagnosis, radiotherapy (including Röntgen, radium, and helio therapy), medical electrology, radio physics, and instruction in medical radiology. Summary addresses will be given on different branches of radiology and a series of papers will be presented on instruction and training in medical radiology, with particular reference to experiences gained in the different countries.

The question of establishing an international unit dosage for Röntgen rays, as well as the question of general principles for protective measures, will also be a subject of discussion during the proceedings.

The congress will be held in the House of Parliament.

Persons intending to participate in the congress may secure additional information and a membership card, for which a small charge is made, by addressing the Secretary General, Second International Congress of Radiology, Sophiahemmet, Stockholm, Sweden.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Recent Trend in Sewage Disposal Developed in Design for Fostoria, Ohio. J. F. Laboon. Proceedings of the Engineers Society of Western Pennsylvania, vol. 43, No. 3, April, 1927, pp. 149–178. (Abstract by Fred Almquist.)

Of the more important developments in the art of sewage disposal the following are mentioned: The detritus tank for the interception of grease and grit; the separate digestion of sludge; and the means for digestion of large quantities of sludge as in the activated sludge type of disposal. The second will be adopted for the proposed plant of Fostoria, Ohio.

After reviewing the various stages in the construction of sewage disposal facilities at Fostoria, the author comments on an acid sewage which occurred from time to time and which deleteriously affected all physical fixtures below the flow line. The acid sewage was caused by a particular industry, which later installed a lime neutralization plant. In 1926 the city was restrained from using Portage River as a receiving basin for the effluent from their disposal plant Consequently, additional disposal facilities had to be sought.

The new improvements consist of grit-handling apparatus, transformation of an Imhoff tank into a separate sludge digestion tank, thickeners, dosing tanks, trickling filters, humus tank, and some others less important. Digestion in the separate sludge tank will be hastened by heating in the winter. The heater will be arranged to use gas collected from the digestion tank. Lime will be added to obtain optimum hydrogen ion concentration of the sludge for the elimination of acid digestion. Trickling filter rate is 2,500 people per acre per foot of depth on a basis of an average depth of 7 feet.

Wet Sludge as Fertilizer. S. Duxbury. *Public Works*, vol. 58, No. 10, October, 1927, pp. 374-375. (Abstract by R. J. Faust.)

The fertilizer value of wet sludge, 95 per cent moisture, from the Bedford, England, sewage treatment plant is 87 per cent greater than similar sludge air dried, 28 per cent moisture, as determined by actual experiments. The elevation of the sludge outlet valves at the plant are above the surrounding land so that it is possible to discharge the wet sludge on the land by gravity. The advantages claimed by this method of sludge disposal are— (1) Sludge is never so valuable for fertilization as when fresh; (2) it can be more evenly distributed; (3) fresh sludge warms cold soils, makes them more porous, and the fermentations that take place during decay tend to make the soil more mellow; (4) the plant food is more available; (5) when spread evenly and thinly, there is no loss of its valuable constituents through early fermentation; (6) the crop is more even; (7) it improves the mechanical condition and drainage of the soil; (8) it is disposed of with advantage at a low cost.

Operating Results of the Essen Activated Sludge Plant. Karl Imhoff. (Translated from the German by Gordon M. Fair). *Engineering News-Record*, vol. 99, No. 20, November 17, 1927, pp. 790-791. (Abstract by C. H. Kibbey.)

The activated sludge plant at Essen-Rellinghausen has been in operation since December, 1925, serves 45,000 people, and receives a dry-weather flow approximating 130 gallons per capita per day. The wooden paddles (mechanical agitation device) used in conjunction with compressed air have continued to show their usefulness. With a three and one-half hour aeration period the air consumption is only 0.08 cu. ft. per gallon, and the entire power consumption is 7 h. p. per m. g.

The analytical results, which are comprehensively stated in a table, show a reduction in suspended solids of from 180 p. p. m. in raw sewage, and 120 p. p. m. in Imhoff tank effluent, to 6 p. p. m. in effluent from the activated sludge plant. Consumed oxygen is shown as 532 p. p. m. in raw sewage, 350 p. p. m. in Imhoff tank effluent and 30 p. p. m in effluent from the activated sludge plant. The hydrogen ion concentration remains relatively the same for raw sewage, Imhoff tank effluent and effluent from the activated sludge plant being expressed as pH 7.5 for both raw sewage and tank effluent and 7.2 for activated sludge plant.

Heating is accomplished by raising the temperature of water from the pressure supply mains, in a boiler heated by sludge gas, to 70° or 80° C., and then introducing it into the bottom of the digestion tank. This obviates the difficulties experienced where heating coils are passed through the sludge. The temperature in the sludge tank, which was 8° to 9° C. prior to heating, has since been maintained at 21° C., with a tenfold increase in gas production and consequent increased digestion tank efficiency. Only that gas generated in the digestion tank is used in this way. Gas from the Imhoff tanks is sold to the municipal gas works. Since heating has been introduced, the total gas production has been increased, the CO_2 content of the gas has increased somewhat, and the methane content remains over 73 per cent.

The construction cost, exlusive of preliminary clarification units, is now $90,000, with an operating cost of $12,500 per annum.

Sewage Disposal in the Lower Lea Valley, Essex. Anon. *Surveyor*, vol. 72, No. 1866, October 28, 1927, pp. 391-392. (Abstract by R. E. Thompson.)

A new outfall sewer was recently put into commission in Leyton for delivering the sewage of the district into the London County Council system. The work is the culmination of negotiations which have been proceeding since 1906. The arrangements were completed in conjunction with the Walthamstow Council. Venturi recording apparatus and electrically-controlled cutting-off gear have been provided, the latter diverting sewage into stand-by storage tanks when the

sewage in the London County Council sewer reaches a predetermined level and when rate of flow from Leyton exceeds a specified amount (50 gallons per day per head of population upon an agreed figure). The average length of time during which the sewage has been at the specified level for several years is about 14 hours per annum. When the level recedes, the sewage from the tanks, which have total capacity of over 2¼ million gallons, flows back into the county council sewer.

Conditions at Sewage Works of Milwaukee, Wisconsin. Robert Cramer. *Engineering News-Record*, vol. 99, No. 19, November 10, 1927, p. 751. (Abstract by D. E. Kepner.)

In a paper read before the Lake Michigan Sanitation Congress, abstracted in this article, the author states that the purification possibilities of the activated sludge process are being demonstrated on a large scale at the Milwaukee plant. An average of 70 m. g. d. was being treated at the time the paper was prepared, or about 75 per cent of the then dry-weather flow. By increasing the capacity of some of the sludge dewatering apparatus and correcting certain faulty designing, the capacity of this part of the process will be increased to permit operation of the entire plant at full dry-weather-flow rate.

Changes and additions being made to permit more efficient operation include the rebuilding of the drier settings so that the excess air necessary for drying is mixed with gases of combustion in the furnace, resulting in lower furnace temperatures and increasing the life of the fire brick. Troublesome odors from the drier discharges were being treated with chlorine gas, with good results.

Experiments with fine screenings showed that pressing was impracticable, but that a salable fertilizer could be produced from them by pressure cooking, and that an inert product resulted from their biological digestion.

Sink Hole Topography Study for Sewage Disposal. J. E. Lamar. *Engineering News-Record*, vol 99, No. 16, October 20, 1927, pp. 642–643. (Abstract by A. H. Wieters.)

A proposal by the city of Alton, Illinois, to dispose of sewage from a rapidly growing subdivision into a sink hole resulted in a study by the Illinois Geological Survey and the Illinois Department of Health. The question raised was whether the sewage thus disposed of would enter the Mississippi River directly above the Alton Water Works intake. The study disclosed that it would.

Fluorescein was introduced into the stream entering the sink hole and by the following morning green color persisted for two hundred feet in the Mississippi River below the mouth of the subterranean channel.

The article describes in detail the geology of the area.

Interstate Control of Stream Pollution. John E. Monger. *Nation's Health*, Vol. 9, No. 8, August 15, 1927, pp. 16–18 and 68. (Abstract by Paul S. Fox.)

The writer believes that the State health department is the logical organization to exercise control of stream pollution. Citation is made of the cooperation of the nine State health departments which are interested in the control of the Ohio River system. Brief descriptions of the methods employed by some of the industries affected to solve their own problems are given. "The possibilities of cooperative action among the States, and particularly the health departments of the States, are apparently unlimited; and with the development of a conscience by the States, the stream pollution problems as affecting one another may be solved without the intervention of Federal agencies."

Sanitary Construction and Arrangement of Milk Pasteurizing Plants. C. A. Holmquist. *American Journal of Public Health*, vol. 17, No. 11, November, 1927, pp. 1121–1124. (Abstract by H. D. Cashmore.)

The knowledge that Pasteurized milk is safe and keeps well has led to an enormous consumption of this ideal food and requires that much attention be given to the location, construction, and maintenance of Pasteurizing plants as well as efficiency of operation.

The selection of a site for the plant is usually based on economic considerations, but sanitary considerations can not be ignored. Nearness to transportation and center of distribution are important from an economic standpoint, but freedom from dust and traffic congestion are important also. Location as to barns and other fly-breeding places is discussed briefly in this article.

Under the heading of construction of building, the following points are discussed: (1) Equipment; (2) lavatories and toilets; (3) offices, boiler rooms, etc.; (4) light and ventilation; (5) floors, walls, and ceilings.

A complete but brief summary covering the important points of the article appears at the end.

Improvements in Lime-Soda Water Softening Methods at Columbus, Ohio. Chas. P. Hoover. Sixth Annual Report of Ohio Conference on Water Purification, 1926, pp. 63–71. (Abstract by R. E. Thompson.)

The theoretical limit for softening by lime-soda process is 2 g. per g., and this limit can not be reached in practice unless heat is employed or excess chemicals are used. This is believed to be due to the formation of complex basic carbonates. A chart is given showing theoretical and actual reduction in alkalinity and incrustants by addition of soda ash in increasing quantities to a magnesium water. Efficiency may be increased by split treatment, proper agitation, and by use of a coagulant. At Columbus it has been found that hardness can be reduced from 318 to less than 60 p. p. m. without the use of excess chemicals by adding 5 g. per g. of alum. Experiments are being conducted on zeolite softening. While it is cheaper to remove carbonate hardness with lime than by base exchange, the cost of removing noncarbonate hardness by the latter method is only one-half that of soda ash treatment. It is planned to replace sand in one of the filters with zeolite sand for experimental purposes. It is believed that hardness can be reduced to 160 p. p. m. with lime, and that to produce water of 80 p. p. m. it will be necessary further to treat only one-half of total in zeolite filters.

Comfort Stations are not Necessarily Nuisances as to Owners of Adjacent Property. Anon. *American City*, vol. 38, No. 1, January, 1928, p. 181–182.

Refusing to abate a municipal comfort station upon the plea that it per se constituted a nuisance against near-by property owners, the Washington Supreme Court said in the case of Zey *v.* Town of Long Beach (258 Pacific Reporter, 492):

"A comfort station is not a nuisance per se and may or may not be such in fact, depending upon the attendant facts and circumstances * * *. Before it can be held that the comfort station constituted a nuisance, it must be found that it interfered with the comfortable enjoyment of the appellants in their life and use of their property * * *. There is no direct evidence that the rental value of the rooms or cottages was impaired by the presence of the comfort station or that the value of the property was reduced. It is undoubtedly true that the presence of the comfort station directly to the west and immediately in front of the residence of the appellants is not a thing to be desired. It would offend against the esthetic sense, but this would not be sufficient to make it a nuisance."

Public Health Engineering in Australia. F. F. Longley. *American Journal of Public Health*, vol. 17, No. 3, March, 1927, pp 228–232. (Abstract by H. D. Cashmore.)

Through the influence of the International Health Board some few years ago, sanitary engineering was given a foothold in Australia; and the interest shown by the Government and the views already taken on this work have made it possible firmly to establish sanitary engineering as a public health activity.

Until this time no engineers were included in the health organisation, as sanitary engineering work under state health officers was considered unnecessary. The first step was to adopt a policy in regard to who should be the authority to enforce this work, State or Commonwealth, and State rights won out. The next step was the selling of public health engineering to the people, and a conference of all State medical officers was held to plan the future work. Out of this came *Health*, the vehicle by which the advertising was carried on.

One of the chief sanitary problems was the installation of sewerage systems in the larger towns. In places where they were not practicable, the disposal of night soil was studied. In this connection there was outlined a definite set of problems to be studied and solved.

Knowing that the International Health Board was there for only a limited time, an engineer of some experience was appointed to take charge of this work. He was sent to America and Europe to study the latest ideas on this work. Based upon the activity and interest shown by the people, a five-year program was presented at a second meeting of the health officers assembled to discuss public health.

Sanitary Problems in a Colliery District. W. A. Murphy. *Journal of State Medicine*, vol. 35, No. 9, September, 1927, pp. 545–549. (Abstract by L. M. Fisher.)

Colliery towns are usually built in narrow ravines where there is barely room for river, railroad, and highway. The stream is polluted with coal washings and surface wash from the villages. The water supply frequently obtained from surface sources is often contaminated.

Subsidence due to mining operations damages the houses so that many are made uninhabitable. The pneumonia rate among the workers is high. Pit-head baths should be provided. Smoke-abatement measures should be instituted. The sanitary problems in general are peculiar to collieries.

DEATHS DURING WEEK ENDED FEBRUARY 18, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended February 18, 1928, and corresponding week of 1927. (From the Weekly Health Index, February 23, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Feb. 18, 1928	Corresponding week, 1927
Policies in force	69, 956, 655	66, 767, 638
Number of death claims	12, 983	14, 209
Death claims per 1,000 policies in force, annual rate	9. 7	11. 1

Deaths from all causes in certain large cities of the United States during the week ended February 18, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 23, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Feb. 18, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 18, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb. 18, 1928	Corresponding week 1927	
Total (68 cities)	8,131	14.0	13.5	848	920	[3] 70
Akron	49			10	10	109
Albany [4]	43	18.7	16.1	0	3	0
Atlanta	66	13.6	16.3	6	11	
White	41		10.1	2	3	
Colored	25	(5)	31.0	4	8	
Baltimore [4]	280	17.6	16.9	36	42	114
White	208		14.2	22	26	88
Colored	72	(5)	32.9	14	16	219
Birmingham	67	15.8	15.3	11	9	94
White	24		13.0	1	4	14
Colored	43	(5)	19.1	10	5	225
Boston	248	16.2	15.9	35	35	97
Bridgeport	41			4	2	73
Buffalo	158	14.9	15.9	16	19	69
Cambridge	30	12.5	11.8	3	3	53
Camden	27	10.4	15.3	3	7	48
Canton	23	10.3	7.8	7	2	166
Chicago [4]	801	13.3	11.6	79	79	68
Cincinnati	149	18.8	19.6	18	19	109
Cleveland	201	10.4	10.3	19	21	52
Columbus	83	14.6	15.6	9	4	84
Dallas	67	16.1	14.8	8	5	
White	46		13.6	6	5	
Colored	21	(5)	22.8	2	0	
Dayton	58	16.4	12.7	4	5	66
Denver	101	17.9	17.1	12	6	
Des Moines	32	11.0	11.2	2	3	33
Detroit	285	10.8	12.7	41	71	63
Duluth	24	10.7	10.5	3	2	70
El Paso	44	19.5	13.8	8	5	
Erie	29			3	5	62
Fall River [4]	42	16.4	14.5	9	9	154
Flint	37	13.0	6.9	5	4	64
Fort Worth	42	13.1	11.8	5	4	
White	35		11.6	5	4	
Colored	7	(5)	13.3	0	0	
Grand Rapids	33	10.5	12.6	4	6	60
Houston	75			6	8	
White	58			6	7	
Colored	17	(5)		0	1	
Indianapolis	95	13.0	12.3	6	12	46
White	78		12.8	6	7	52
Colored	17	(5)	8.1	0	5	0
Jersey City	88	14.2	13.1	14	9	105
Kansas City, Kans	32	14.1	16.4	5	6	106
White	23		15.7	2	3	49
Colored	9	(5)	19.7	3	3	436
Kansas City, Mo	127	17.0	17.1	10	9	71
Knoxville	23	11.4	15.8	4	1	87
White	20		12.2	4	1	97
Colored	3	(5)	42.7	0	0	0
Los Angeles	334			27	28	77
Lowell	30	14.2	16.5	4	6	84
Lynn	29	14.4	11.4	2	3	50
Memphis	76	20.9	16.0	12	8	141
White	42		10.8	7	5	131
Colored	34	(5)	25.5	5	3	157
Milwaukee	104	10.0	10.2	12	15	54
Minneapolis	75	8.6	10.7	5	13	30
Nashville	58	21.9	20.8	7	7	110
White	29		20.0	2	4	43
Colored	29	(5)	22.8	5	3	300
New Bedford	32	14.0	13.5	2	5	43
New Haven	38	10.6	11.3	4	4	56
New Orleans	198	24.1	18.6	14	19	68
White	125		14.9	8	7	58
Colored	73	(5)	29.3	6	12	87

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended February 18, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927—Continued

City	Week ended Feb. 18, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 18, 1928
	Total deaths	Death rate		Week ended Feb. 18, 1928	Corresponding week 1927	
New York	1,652	14.4	13.2	191	152	77
Bronx Borough	198	10.9	10.1	18	11	54
Brooklyn Borough	569	12.9	12.8	87	66	87
Manhattan Borough	674	20.1	17.0	62	65	73
Queens Borough	167	10.2	8.5	20	9	81
Richmond Borough	44	15.3	15.3	4	1	72
Newark, N. J	108	11.9	13.0	18	19	93
Oakland	70	13.4	15.8	6	2	65
Oklahoma City	35			3	0	
Omaha	67	15.7	14.7	3	1	35
Paterson	39	14.1	14.1	6	8	104
Philadelphia	602	15.2	13.3	61	59	82
Pittsburgh	192	14.9	13.1	21	23	69
Portland, Oreg	70			2	6	21
Providence	69	12.6	13.0	5	11	44
Richmond	56	15.1	15.0	0	4	0
White	32		15.3	0	3	0
Colored	24	(5)	14.1	0	1	0
Rochester	86	13.7	14.0	7	7	57
St. Louis	219	13.5	13.0	15	18	59
St. Paul	75	15.5	12.9	6	3	57
Salt Lake City[4]	26	9.9	18.1	0	6	0
San Antonio	79	18.9	13.3	11	14	
San Diego	45	19.7	19.0	2	12	38
San Francisco	160	14.3	15.6	9	8	57
Schenectady	24	13.4	10.6	4	2	125
Seattle	70	9.6	9.0	3	1	31
Somerville	29	14.8	10.3	4	4	138
Spokane	31	14.9	18.2	1	2	26
Springfield, Mass	34	11.9	14.2	3	7	48
Syracuse	38	10.0	16.1	6	7	73
Tacoma	29	13.7	13.1	1	1	26
Toledo	72	12.0	12.5	2	11	19
Trenton	31	11.7	13.4	7	5	119
Washington, D. C	140	13.3	16.5	3	26	17
White	88		12.8	2	11	17
Colored	52	(5)	27.6	1	15	18
Waterbury	30			4	2	116
Wilmington, Del	25	10.2	14.4	2	2	53
Worcester	53	14.0	13.3	1	6	12
Yonkers	28	12.1	7.0	3	1	68
Youngstown	36	10.8	10.8	3	7	40

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 68 cities.
[4] Deaths for week ended Friday, Feb. 17, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended February 26, 1927, and February 25, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February ‛26, 1927. and February 25, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 192?	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928
New England States:								
Maine	2	1	10	6	177	46	1	2
New Hampshire	-------	-------	-------	-------	-------	-------	-------	-------
Vermont	1	-------	-------	-------	55	4	0	0
Massachusetts	100	127	18	11	239	1,691	1	1
Rhode Island	11	9	4	-------	-------	63	1	0
Connecticut	27	26	18	3	138	358	0	2
Middle Atlantic States:								
New York	367	391	[1] 185	[1] 55	847	1,659	3	9
New Jersey	97	152	34	16	55	790	1	3
Pennsylvania	205	194	-------	-------	872	1,047	2	2
East North Central States:								
Ohio	-------	181	-------	9	-------	538	-------	2
Indiana	28	26	46	25	200	151	1	0
Illinois	118	170	29	40	2,306	156	3	7
Michigan	104	60	-------	-------	281	532	0	1
Wisconsin	30	85	80	41	601	80	6	1
West North Central States:								
Minnesota	31	26	3	4	274	2	2	4
Iowa	32	13	-------	-------	747	65	0	0
Missouri	42	59	26	40	220	159	2	0
North Dakota	1	3	-------	2	149	-------	2	2
South Dakota	1	-------	14	-------	269	28	0	0
Nebraska	4	9	14	-------	181	7	0	5
Kansas	21	22	11	61	730	72	2	0
South Atlantic States:								
Delaware	1	-------	-------	-------	4	4	0	0
Maryland [2]	66	48	226	61	37	750	0	0
District of Columbia	25	-------	7	-------	7	-------	0	-------
Virginia	-------	-------	-------	-------	-------	-------	-------	-------
West Virginia	26	16	56	59	198	119	5	2
North Carolina	28	50	-------	-------	512	3,877	1	0
South Carolina	23	15	157	1,058	19	1,270	0	0
Georgia	23	4	298	189	253	325	0	1
Florida	30	9	17	5	78	16	2	1

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 26, 1927, and February 25, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928
East South Central States:								
Kentucky	-------	5	-------	-------	-------	243	-------	0
Tennessee	17	12	84	103	240	474	3	4
Alabama	39	42	76	244	235	365	0	2
Mississippi	18	11	-------	-------	-------	-------	-------	0
West South Central States.								
Arkansas	1	10	149	363	29	673	0	0
Louisiana	22	22	15	129	114	274	1	1
Oklahoma [3]	20	30	179	420	123	239	1	2
Texas	37	19	23	30	26	133	0	1
Mountain States:								
Montana	1	3	1	-------	71	2	8	3
Idaho	1	1	-------	-------	66	-------	0	6
Wyoming	1	3	-------	2	163	-------	0	4
Colorado	6	12	1	12	185	44	3	9
New Mexico	1	1	2	-------	41	143	0	0
Arizona	2	6	1	4	9	7	0	1
Utah [2]	6	4	4	-------	280	3	1	4
Nevada	-------	-------	-------	-------	-------	-------	-------	-------
Pacific States:								
Washington	18	12	3	-------	177	279	4	2
Oregon	16	10	478	22	77	72	3	1
California	132	124	79	51	3,186	151	2	4

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928
New England States:								
Maine	0	0	20	23	0	0	5	1
New Hampshire	-------	-------	-------	-------	-------	-------	-------	-------
Vermont	0	0	5	20	0	0	0	1
Massachusetts	1	2	588	326	0	0	7	4
Rhode Island	0	0	17	33	0	0	0	1
Connecticut	0	0	107	89	0	2	0	4
Middle Atlantic States:								
New York	0	4	1,081	803	6	10	13	16
New Jersey	1	0	381	294	0	0	7	2
Pennsylvania	0	1	660	568	0	0	16	9
East North Central States:								
Ohio	-------	2	-------	309	-------	31	-------	6
Indiana	0	0	208	150	92	114	4	0
Illinois	2	1	389	331	21	53	10	3
Michigan	0	1	362	228	51	37	8	10
Wisconsin	2	1	288	185	14	21	2	4
West North Central States:								
Minnesota	0	1	264	148	5	0	6	1
Iowa	0	1	71	82	24	77	0	1
Missouri	1	0	142	94	15	53	8	6
North Dakota	0	0	128	59	0	4	1	2
South Dakota	0	1	76	46	6	3	4	0
Nebraska	0	0	61	108	16	17	2	2
Kansas	2	0	187	319	33	105	3	3
South Atlantic States:								
Delaware	0	0	27	10	0	0	1	1
Maryland [2]	0	0	77	91	0	0	3	5
District of Columbia	0	-------	17	-------	0	-------	1	-------
Virginia	-------	-------	-------	-------	-------	-------	-------	-------
West Virginia	0	0	69	56	32	54	17	14
North Carolina	0	0	27	84	85	118	3	2
South Carolina	6	1	10	14	24	4	15	10
Georgia	2	0	16	21	154	0	10	18
Florida	0	2	20	5	77	4	9	9

[2] Week ended Friday. [3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 26, 1927, and February 25, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928	Week ended Feb. 26, 1927	Week ended Feb. 25, 1928
East South Central States:								
Kentucky	------	0	------	31	------	30	------	2
Tennessee	0	0	39	48	15	34	2	7
Alabama	0	3	19	7	50	7	15	25
Mississippi	0	1	9	22	7	4	7	6
West South Central States:								
Arkansas	0	0	12	41	14	7	10	10
Louisiana	0	1	23	10	6	22	9	4
Oklahoma [3]	0	4	36	61	53	190	13	18
Texas	0	0	28	51	29	12	2	1
Mountain States:								
Montana	0	0	79	15	5	12	0	0
Idaho	1	0	20	9	1	2	0	0
Wyoming	0	0	39	37	1	3	0	1
Colorado	0	0	162	117	5	12	0	0
New Mexico	0	2	28	13	8	2	2	0
Arizona	0	0	17	5	0	26	0	0
Utah [1]	0	0	14	9	0	23	2	0
Nevada	------	------	------	------	------	------	------	------
Pacific States:								
Washington	0	1	91	56	45	82	5	2
Oregon	0	1	34	31	21	30	1	2
California	1	6	244	229	30	32	1	7

[1] Week ended Friday. [3] Exclusive of Tulsa.

Report for Week Ended February 11, 1928

IDAHO

	Cases		Cases
Scarlet fever	3	Smallpox	2

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January, 1928										
California	26	581	151	------	367	2	30	845	109	35
Georgia	1	56	698	79	513	9	1	70	32	30
Iowa	12	85	------	------	284	------	6	368	359	11
Louisiana	4	104	214	31	406	8	1	51	68	33
Maryland	2	131	211	------	1,358	------	4	285	2	27
Massachusetts	11	485	58	------	5,518	1	18	1,508	3	28
Michigan	0	375	30	1	1,550	------	8	1,125	169	22
Minnesota	13	153	5	------	28	------	0	707	11	18
New Hampshire	0	1	65	------	------	------	0	83	0	0
New Jersey	11	761	71	1	1,051	------	3	987	4	27
New York	23	1,835	------	3	4,607	------	28	2,857	44	92
West Virginia	3	75	107	------	345	------	9	243	88	26
Wisconsin	15	149	334	------	276	------	3	772	130	8

January, 1928

	Cases
Anthrax:	
Massachusetts	1
New Jersey	1
Botulism:	
California	1
Chicken pox:	
California	1,996
Georgia	115
Iowa	224
Louisiana	47
Maryland	712
Massachusetts	1,320
Michigan	770
Minnesota	412
New Jersey	1,006
New York	2,507
West Virginia	241
Wisconsin	1,175
Dysentery:	
California (amebic)	2
California (bacillary)	10
Georgia	7
Louisiana	1
Maryland	4
New York	3
German measles:	
California	1,018
Iowa	23
Maryland	10
Massachusetts	104
New Jersey	129
New York	223
Wisconsin	34
Hookworm disease:	
Louisiana	8
Impetigo contagiosa:	
Iowa	2
Maryland	1
Lead poisoning:	
Massachusetts	5
New Jersey	2
Leprosy:	
California	1
Louisiana	1
Lethargic encephalitis:	
California	6
Louisiana	2
Maryland	2
Massachusetts	2
Michigan	2
Minnesota	2
New York	22
Wisconsin	3
Malta fever:	
Minnesota	1
Mumps:	
California	623
Georgia	85
Iowa	168
Louisiana	31
Maryland	118
Massachusetts	1,311
Michigan	1,092
New York	2,286
Wisconsin	828

	Cases
Ophthalmia neonatorum:	
California	1
Maryland	3
Massachusetts	162
New Jersey	2
New York	3
Wisconsin	1
Paratyphoid fever:	
California	1
New Jersey	2
New York	4
Puerperal septicemia:	
New York	2
Rabies in animals:	
California	66
Maryland	1
New York	13
Rabies in man:	
Georgia	1
Scabies:	
Maryland	4
Septic sore throat:	
Georgia	12
Maryland	14
Massachusetts	91
Michigan	34
New York	20
Tetanus:	
California	1
Louisiana	2
Massachusetts	3
New York	3
Trachoma:	
California	16
Louisiana	1
Massachusetts	3
Minnesota	5
New Jersey	1
New York	4
Wisconsin	1
Trichinosis:	
California	3
Massachusetts	9
New Jersey	1
Tularaemia:	
Louisiana	1
Maryland	3
Typhus fever:	
Maryland	1
Vincents angina:	
Maryland	13
New York	84
Whooping cough:	
California	516
Georgia	31
Iowa	42
Louisiana	24
Maryland	138
Massachusetts	1,271
Michigan	596
Minnesota	55
New Jersey	723
New York	2,125
West Virginia	141
Wisconsin	298

RECIPROCAL NOTIFICATIONS

Notifications regarding communicable diseases sent during the month of January, 1928, by departments of health of certain States to other State health departments

	Anthrax	Diphtheria	Measles	Scarlet fever	Small pox	Typhoid fever	Tuberculosis
Illinois		2		1	9	1	
Minnesota						1	20
New York	1		2	3		1	
Washington						1	

PLAGUE-PREVENTION WORK IN THE UNITED STATES

Seattle, Wash.—The reports of rat-trapping operations of the United States Quarantine Station at Seattle for the months of December, 1927, and January, 1928, show a total of 2,199 rodents taken and 1,055 examined. None were reported plague-infected.

Los Angeles, Calif.—The rodent division of the Los Angeles Board of Health reports 7,888 rodents collected, and 4,822 examined during the nine weeks from December 4, 1927 to February 4, 1928. None were found plague-infected.

San Francisco Calif.—The weekly reports of plague-suppressive measures in California during the six weeks November 27, 1927, to January 7, 1928, show a total of 4,190 rodents received and 3,470 examined. No plague infection was reported during this period. The last case of human plague occurred in July, 1927, in Contra Costa County.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 100 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,100,000. The estimated population of the 94 cities reporting deaths is more than 30,400,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended February 11, 1928, and February 12, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
41 States	2,021	1,863	
100 cities	999	1,049	1,025
Measles:			
40 States	15,002	12,047	
100 cities	4,367	3,880	
Poliomyelitis:			
41 States	40	12	
Scarlet fever:			
41 States	4,989	5,964	
100 cities	1,768	2,299	1,461
Smallpox:			
41 States	1,225	887	
100 cities	129	156	126
Typhoid fever:			
41 States	196	240	
100 cities	44	42	36
Deaths reported			
Influenza and pneumonia:			
94 cities	1,073	980	
Smallpox:			
94 cities	0	0	

City reports for week ended February 11, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	2	1	2	0	0	0	11	0
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	2
Manchester	84,000	0	3	0	0	0	3	0	1
Vermont:									
Barre	[1] 10,008	2	0	0	0	0	0	0	0
Burlington	[1] 24,089	3	1	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	68	51	21	3	1	517	3	17
Fall River	131,000	11	5	6	1	1	0	0	1
Springfield	145,000	6	2	4	1	0	4	37	3
Worcester	193,000	24	5	3	0	0	15	74	4
Rhode Island:									
Pawtucket	71,000	5	1	0	0	0	5	23	5
Providence	275,000	4	10	9	0	0	5	4	13
Connecticut:									
Bridgeport	([2])	7	9	8	0	1	8	0	4
Hartford	164,000	6	8	5	0	0	2	2	2
New Haven	182,000	18	2	1	0	0	151	31	14
MIDDLE ATLANTIC									
New York:									
Buffalo	541,000	-----	15	-----	-----	-----	-----	-----	-----
New York	5,924,000	203	213	319	40	14	284	37	264
Rochester	321,000	14	11	12	1	1	10	11	5
Syracuse	185,000	28	4	2	-----	0	64	17	1
New Jersey:									
Camden	131,000	6	5	10	2	2	1	1	5
Newark	459,000	38	14	27	11	2	219	25	19
Trenton	134,000	4	4	4	0	1	16	1	4
Pennsylvania:									
Philadelphia	2,008,000	63	79	64	-----	5	82	102	59
Pittsburgh	637,000	31	20	17	-----	3	233	89	30
Reading	114,000	23	3	8	-----	0	0	2	3
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	14	10	5	0	1	279	7	12
Cleveland	960,000	62	34	74	1	0	21	203	11
Columbus	285,000	10	4	1	1	0	9	4	3
Toledo	295,000	46	8	4	2	2	202	16	11
Indiana:									
Fort Wayne	99,900	1	3	2	0	0	0	0	6
Indianapolis	367,000	34	9	10	0	0	22	59	15
South Bend	81,700	0	1	0	0	0	1	0	3
Terre Haute	71,900	2	1	0	0	0	0	0	0
Illinois:									
Chicago	3,048,000	123	90	108	22	9	23	41	68
Springfield	64,700	18	1	0	0	0	0	15	1

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended February 11, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit	1,290,000	51	64	37	4	2	299	48	31
Flint	136,000	22	6	1	0	0	3	120	5
Grand Rapids	156,000	0	3	0	0	1	15	11	2
Wisconsin:									
Kenosha	52,700	24	2	1	0	0	1	8	2
Madison	47,600	7	1	0	0	0	3	0	0
Milwaukee	517,000	70	19	26	2	2	0	27	11
Racine	69,400	10	2	2	0	0	0	0	3
Superior	[1] 39,671	0	1	0	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	1	1	4	0	0	1	4	3
Minneapolis	434,000	65	18	6	0	1	1	6	9
St. Paul	248,000	21	15	2	0	1	0	32	10
Iowa:									
Davenport	[1] 52,469	3	2	0	0	--------	0	0	--------
Des Moines	146,000	0	3	0	0	--------	0	0	--------
Sioux City	78,000	5	2	0	0	--------	23	30	--------
Waterloo	36,900	1	0	0	0	--------	0	0	--------
Missouri:									
Kansas City	375,000	24	8	1	0	0	8	136	12
St. Joseph	78,400	1	2	1	0	0	0	4	5
St. Louis	830,000	27	49	33	3	0	75	17	--------
North Dakota:									
Fargo	[1] 26,403	11	1	0	0	0	0	2	0
Grand Forks	[1] 14,811	0	0	1	0	--------	1	0	--------
South Dakota:									
Aberdeen	[1] 15,036	3	0	0	0	--------	1	0	--------
Sioux Falls	[1] 30,127	0	1	0	0	--------	0	0	--------
Nebraska:									
Omaha	216,000	10	4	3	0	0	2	2	8
Kansas:									
Topeka	56,500	50	2	1	0	0	1	2	1
Wichita	92,500	0	4	0	0	0	0	1	4
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	7	2	2	0	0	0	0	0
Maryland:									
Baltimore	808,000	107	34	19	22	5	448	15	45
Cumberland	[1] 33,741	2	1	0	0	0	0	0	1
Frederick	[1] 12,035	0	0	1	1	0	0	0	2
District of Columbia:									
Washington	528,000	26	21	31	1	1	36	0	21
Virginia:									
Lynchburg	30,500	4	1	2	0	0	9	0	2
Norfolk	174,000	10	2	1	0	0	14	2	7
Richmond	189,000	2	4	0	0	1	81	0	12
Roanoke	61,900	5	1	0	0	1	7	0	3
West Virginia:									
Charleston	50,700	0	1	1	0	0	0	0	1
Wheeling	[1] 56,208	2	1	0	0	0	1	0	2
North Carolina:									
Raleigh	[1] 30,371	9	0	0	0	0	19	0	1
Wilmington	37,700	2	0	0	0	0	38	1	1
Winston-Salem	71,800	1	1	1	0	0	237	8	5
South Carolina:									
Charleston	74,100	3	0	1	57	1	9	0	3
Columbia	41,800	9	0	1	0	1	84	22	0
Greenville	[1] 27,311	0	0	0	0	1	40	4	1
Georgia:									
Atlanta	([2])	9	3	1	49	5	0	6	10
Brunswick	[1] 16,809	0	0	0	0	0	46	6	1
Savannah	94,900	0	1	1	9	0	47	0	4
Florida:									
Miami	[1] 69,754	12	2	3	0	0	0	4	0
St. Petersburg	[1] 26,847	--------	0	--------	--------	0	--------	--------	0
Tampa	102,000	19	1	2	0	1	1	1	0

[1] Estimated July 1, 1925.

[2] No estimate made.

City reports for week ended February 11, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	4	1	0	0	0	17	0	4
Louisville	311,000	4	6	2	4	1	40	7	16
Tennessee:									
Memphis	177,000	23	4	3	0	4	139	19	8
Nashville	137,000	4	1	3	0	0	5	9	6
Alabama:									
Birmingham	211,000	15	3	2	9	0	25	4	11
Mobile	66,800	0	0	0	2	3	0	0	0
Montgomery	47,000	5	1	1	3		1	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	2	1	1	0		1	0	
Little Rock	75,900	2	1	0	0	0	166	0	0
Louisiana:									
New Orleans	419,000	5	13	10	12	9	0	0	16
Shreveport	59,500	8	1	0	0	0	77	0	5
Oklahoma:									
Oklahoma City	(2)	1	1	3	12	0	12	0	2
Tulsa	133,000	32	1	3	0		0	32	
Texas:									
Dallas	203,000		6	4	0	0	3		4
Fort Worth	159,000	36	2	8	0	0	4	1	7
Galveston	49,100	1	1	2	0	0	0	0	2
Houston	[1] 164,954	5	4	12	0	0	11	3	8
San Antonio	205,000	4	2	3	0	5	78	0	14
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	0
Great Falls	[1] 29,883	4	1	0	0	0	1	0	1
Helena	[1] 12,037	1	0	1	0	0	0	0	2
Missoula	[1] 12,668	0	0	0	0	0	0	0	1
Idaho:									
Boise	[1] 23,042	1	1	0	0	0	0	2	0
Colorado:									
Denver	285,000	36	13	3		3	17	95	10
Pueblo	43,900	13	2	1	0	0	2	0	1
New Mexico:									
Albuquerque	[1] 21,000	4	0	1	0	0	28	2	0
Utah:									
Salt Lake City	183,000	30	3	0	0	3	1	0	2
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	32	7	4	0		188	21	
Spokane	109,000	12	4	1	0		0	0	
Tacoma	106,000	13	2	0	0	0	28	14	4
Oregon:									
Portland	[1] 282,383	35	9	7	0	0	18	4	11
California:									
Los Angeles	(2)	70	44	37	27	3	28	23	48
Sacramento	73,400	19	3	2	0	0	18	0	4
San Francisco	567,000	126	23	8	5	3	24	49	3

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended February 11, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	4	1	0	0	0	1	1	0	0	13	27
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	10
Manchester	3	4	0	0	0	0	0	0	0	0	15
Vermont:											
Barre	0	1	0	0	0	0	0	0	0	0	3
Burlington	1	0	0	0	0	1	0	0	0	0	9
Massachusetts:											
Boston	79	89	0	0	0	20	1	2	0	85	242
Fall River	3	18	0	0	0	2	1	0	0	1	23
Springfield	8	14	0	0	0	1	0	0	0	12	38
Worcester	10	6	0	0	0	2	0	0	0	23	51
Rhode Island:											
Pawtucket	1	3	0	0	0	0	0	0	0	0	24
Providence	9	37	0	0	0	5	0	1	0	0	75
Connecticut:											
Bridgeport	13	6	0	0	0	4	0	0	0	5	42
Hartford	6	8	0	0	0	0	0	1	0	15	33
New Haven	11	5	0	0	0	3	0	0	0	29	63
MIDDLE ATLANTIC											
New York:											
Buffalo	25	------	1	------	------	------	1	------	------	------	-
New York	285	387	0	0	0	119	7	6	0	184	1,658
Rochester	13	10	0	0	0	5	0	0	0	7	79
Syracuse	15	22	0	0	0	2	0	0	0	46	50
New Jersey:											
Camden	7	0	0	0	0	3	0	0	0	4	44
Newark	27	38	0	0	0	8	0	0	0	70	108
Trenton	6	8	0	0	0	1	0	1	0	9	38
Pennsylvania:											
Philadelphia	100	111	0	0	0	30	2	[illegible]	0	93	534
Pittsburgh	42	38	0	1	0	11	0	1	0	16	210
Reading	2	23	0	0	0	3	0	0	0	0	25
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	19	15	1	0	0	9	1	0	0	1	144
Cleveland	47	51	1	0	0	13	0	1	0	85	173
Columbus	11	10	1	0	0	3	0	0	0	2	70
Toledo	14	11	1	0	0	3	0	0	0	7	81
Indiana:											
Fort Wayne	6	1	1	0	0	1	0	0	0	0	31
Indianapolis	10	16	12	6	0	1	0	2	0	7	108
South Bend	3	1	0	0	0	0	0	0	0	6	6
Terre Haute	4	1	1	3	0	1	0	0	0	1	12
Illinois:											
Chicago	147	124	2	7	0	44	3	4	1	157	700
Springfield	2	19	0	0	0	0	0	1	0	0	22
Michigan:											
Detroit	100	137	3	1	0	17	1	0	0	101	29[illegible]
Flint	9	24	1	1	0	0	0	0	0	8	2[illegible]
Grand Rapids	12	4	1	0	0	0	0	0	0	7	44
Wisconsin:											
Kenosha	1	3	0	1	0	1	0	0	0	7	[illegible]
Madison	4	1	0	0	0	0	0	1	0	0	------
Milwaukee	29	41	2	2	0	9	0	1	0	13	13[illegible]
Racine	6	23	0	0	0	2	0	0	0	8	12
Superior	4	4	2	0	0	0	0	0	0	0	[illegible]

City reports for week ended February 11, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL											
Minnesota:											
Duluth	8	14	1	0	0	0	0	0	0	6	13
Minneapolis	61	25	5	0	0	8	0	0	0	1	98
St. Paul	36	11	5	0	0	6	0	2	0	1	58
Iowa:											
Davenport	1	5	2	1	------	------	0	0	------	0	------
Des Moines	6	14	1	21	------	------	0	0	------	0	------
Sioux City	2	2	1	0	------	------	0	0	------	4	------
Waterloo	2	10	0	3	------	------	0	1	------	1	------
Missouri:											
Kansas City	13	27	3	4	0	9	1	0	0	9	109
St. Joseph	3	3	0	9	0	2	0	0	0	1	31
St. Louis	46	43	3	2	0	14	1	0	0	31	226
North Dakota:											
Fargo	2	0	0	0	0	0	0	0	1	2	5
Grand Forks	1	2	1	0	------	------	0	0	------	0	------
South Dakota:											
Aberdeen	1	2	0	0	------	------	0	0	------	0	------
Sioux Falls	2	3	0	0	------	------	0	0	------	0	8
Nebraska:											
Omaha	6	8	11	5	0	1	1	0	0	0	60
Kansas:											
Topeka	1	2	1	3	0	0	0	0	0	36	11
Wichita	5	4	1	30	0	0	0	0	0	1	27
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	1	0	0	0	0	0	1	0	0	------
Maryland:											
Baltimore	47	35	0	0	0	15	2	1	0	23	239
Cumberland	1	2	0	0	0	1	0	0	0	0	18
Frederick	2	0	0	0	0	0	0	0	0	0	5
District of Columbia:											
Washington	27	42	2	0	0	9	1	0	0	11	143
Virginia:											
Lynchburg	0	2	0	0	0	0	0	0	0	4	10
Norfolk	1	13	0	0	0	3	0	0	0	2	------
Richmond	3	9	0	0	0	3	1	0	0	0	61
Roanoke	1	4	1	0	0	2	0	0	0	0	18
West Virginia:											
Charleston	1	4	0	3	0	2	0	2	1	0	15
Wheeling	3	1	0	0	0	0	1	0	0	0	17
North Carolina:											
Raleigh	1	0	0	0	0	1	0	0	0	0	8
Wilmington	0	0	0	1	0	0	0	0	0	2	10
Winston-Salem	1	4	4	0	0	0	0	0	0	0	24
South Carolina:											
Charleston	1	0	1	0	0	2	0	0	0	0	30
Columbia	0	0	1	0	0	0	0	0	0	3	19
Greenville	0	0	1	0	0	0	0	0	0	0	6
Georgia:											
Atlanta	4	9	7	3	0	9	0	0	0	0	83
Brunswick	0	0	0	0	0	1	0	0	0	0	5
Savannah	0	0	0	5	0	3	0	0	0	0	25
Florida:											
Miami	1	0	------	0	0	2	1	0	0	0	21
St. Petersburg	0	------	0	------	0	1	0	------	0	------	9
Tampa	0	4	0	0	0	0	1	1	0	0	14
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	1	0	2	0	0	0	0	0	0	20
Louisville	6	16	1	0	0	0	1	0	0	0	67
Tennessee:											
Memphis	5	6	2	0	0	10	1	0	0	2	85
Nashville	4	1	0	0	0	3	0	1	0	0	45
Alabama:											
Birmingham	2	0	5	1	0	5	0	0	1	8	74
Mobile	0	3	1	0	0	1	0	0	1	0	24
Montgomery	0	0	0	0	------	------	0	0	------	0	------

City reports for week ended February 11, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0	------	------	0	1	------	1	------
Little Rock	2	2	0	0	0	0	0	1	0	0	------
Louisiana:											
New Orleans	7	7	1	2	0	14	2	7	0	2	143
Shreveport	1	3	1	0	0	1	1	0	0	2	24
Oklahoma:											
Oklahoma City	2	3	3	13	0	0	0	0	0	0	33
Tulsa	1	6	1	7	------	------	0	0	------	3	------
Texas:											
Dallas	3	3	2	0	0	1	1	0	0		43
Fort Worth	0	8	1	1	0	0	1	0	0	0	28
Galveston	0	1	0	0	0	0	0	1	0	0	13
Houston	2	6	3	2	0	1	0	0	0	0	60
San Antonio	0	3	0	0	0	9	1	0	0	1	62
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	0	0	5	5
Great Falls	2	1	1	0	0	0	0	0	0	0	18
Helena	0	6	0	0	0	0	0	0	0	0	11
Missoula	1	1	1	1	0	0	0	0	0	0	9
Idaho:											
Boise	2	0	1	0	0	0	0	0	0	0	4
Colorado:											
Denver	14	18	2	1	0	6	0	0	0	5	89
Pueblo	2	34	1	2	0	0	0	0	0	4	11
New Mexico:											
Albuquerque	2	1	0	0	0	4	0	0	0	0	9
Utah:											
Salt Lake City	3	1	2	1	0	1	0	0	0	10	37
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	4
PACIFIC											
Washington:											
Seattle	11	3	4	3	------	------	0	0	------	9	------
Spokane	6	6	6	21	------	------	0	0	------	0	------
Tacoma	3	2	4	0	0	3	0	0	0	0	19
Oregon:											
Portland	7	6	8	22	0	3	0	0	1	0	84
California:											
Los Angeles	33	19	7	0	0	28	2	0	3	13	289
Sacramento	2	0	1	2	0	1	0	0	0	5	28
San Francisco	15	45	4	1	0	0	1	0	0	8	160

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	2	1	2	0	0	0	1	0
Worcester	1	0	2	1	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	9	7	6	1	0	0	1	1	2
New Jersey:									
Trenton	0	0	0	1	0	0	0	0	0
Pennsylvania:									
Philadelphia	0	0	0	0	0	0	0	0	1
Pittsburgh	1	1	2	1	0	0	0	0	1

City reports for week ended February 11, 1928—**Continued**

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	1	1	0	0	0	0	0	1	1
Cleveland	0	0	0	0	0	0	0	1	0
Toledo	1	0	0	0	0	0	0	0	0
Illinois:									
Chicago	7	7	2	1	0	0	1	0	0
Michigan:									
Detroit	0	1	0	0	0	0		0	0
Wisconsin:									
Milwaukee	2	2	1	1	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
Missouri:									
Kansas City	1	0	0	0	0	0	0	0	0
St. Louis	2	0	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	1	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	3	0	0	0	0	0	0
South Carolina:									
Columbia	0	0	0	0	0	1	0	0	0
Georgia:									
Savannah [1]	0	0	0	0	1	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	1	1	0	0	0	0	0	0	0
Nashville	0	0	1	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	1	1	3	0	0	0	0
Oklahoma:									
Oklahoma City	1	0	0	0	0	0	0	0	0
MOUNTAIN									
Montana:									
Missoula	1	1	0	0	0	0	0	0	0
Colorado:									
Denver	4	2	0	0	0	0	0	0	0
New Mexico:									
Albuquerque	0	0	1	1	0	0	0	0	0
Nevada:									
Reno	2	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	1	-------	0	------	0	-------	0	0	-------
California:									
Los Angeles	3	3	0	0	0	0	1	1	1
Sacramento	2	0	0	0	0	0	0	0	0
San Francisco	2	0	0	0	0	0	0	1	0

[1] Typhus fever: 1 case at Savannah, Ga.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended February 11, 1928, compared with those for a like period ended February 12, 1927. The population figures used in computing the rates are approximate estimates as of

July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, January 8 to February 11, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1927 [1]

	Week ended—									
	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb 4, 1928	Feb 12, 1927	Feb. 11, 1928
DIPHTHERIA CASE RATES										
101 cities	186	200	175	193	177	[2] 193	194	190	177	[3] 168
New England	174	200	151	168	163	172	146	193	174	136
Middle Atlantic	176	253	191	252	194	251	229	278	188	[3] 235
East North Central	189	220	170	192	175	186	201	145	179	175
West North Central	158	111	146	138	127	131	123	113	154	99
South Atlantic	215	142	161	146	198	146	143	167	222	112
East South Central	248	50	152	105	101	[2] 87	127	55	61	55
West South Central	244	204	170	152	203	164	232	152	149	128
Mountain	117	115	117	168	197	124	188	106	152	44
Pacific	193	143	232	125	167	161	217	156	167	133
MEASLES CASE RATES										
101 cities	339	566	451	619	425	[2] 583	570	724	652	[3] 734
New England	195	1,021	549	1,248	323	1,078	379	1,508	339	1,614
Middle Atlantic	38	500	49	478	46	483	[illegible]	618	45	[3] 467
East North Central	406	300	545	326	536	368	[illegible]	359	780	440
West North Central	192	109	277	259	297	138	453	222	683	216
South Atlantic	202	1,496	301	1,675	256	1,533	536	1,822	359	1,959
East South Central	96	1,521	203	1,387	188	[2] 1,621	269	1,192	451	1,132
West South Central	302	268	447	560	376	500	562	916	451	1,304
Mountain	3,434	106	5,074	97	4,447	88	7,217	115	7,845	186
Pacific	1,478	526	1,342	531	1,504	434	1,538	708	2,220	718
SCARLET FEVER CASE RATES										
101 cities	366	258	384	269	386	[2] 278	403	270	390	[3] 297
New England	479	398	537	508	539	372	509	359	537	432
Middle Atlantic	338	266	368	268	378	288	433	295	423	[3] 327
East North Central	345	285	336	286	347	301	824	289	325	310
West North Central	556	261	517	224	487	273	521	247	499	290
South Atlantic	258	168	280	207	253	200	245	207	258	231
East South Central	213	140	335	190	319	[2] 116	243	130	223	135
West South Central	141	124	194	88	112	128	124	132	74	100
Mountain	1,112	301	1,345	265	1,605	301	1,515	380	1,246	540
Pacific	376	220	319	240	326	296	436	217	389	192
SMALLPOX CASE RATES										
101 cities	22	23	20	22	26	[2] 23	25	21	26	[3] 22
New England	0	0	0	0	[illegible]	0	0	0	0	0
Middle Atlantic	1	0	1	0	0	0	0	0	0	[3] 1
East North Central	21	7	17	9	17	12	22	9	15	14
West North Central	69	146	59	121	79	121	53	117	71	109
South Atlantic	51	26	34	14	60	14	43	18	63	21
East South Central	86	15	25	55	86	[2] 29	101	20	81	15
West South Central	25	28	62	4	41	20	79	12	66	16
Mountain	0	142	0	106	9	133	[illegible]	115	18	44
Pacific	87	31	63	64	71	59	63	59	76	60

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.

[2] Louisville, Ky., not included.

[3] Buffalo, N. Y., not included.

Summary of weekly reports from cities, January 8 to February 11, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1927—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928
101 cities	9	8	7	6	7	[2] 8	7	7	7	[3] 7
New England	21	14	2	9	5	21	9	14	5	9
Middle Atlantic	8	5	5	3	4	5	9	5	5	[3] 6
East North Central	1	3	6	6	2	5	5	3	3	6
West North Central	6	8	4	2	8	8	4	2	6	6
South Atlantic	16	2	7	5	18	7	5	5	18	9
East South Central	15	55	10	30	35	[2] 29	5	15	10	5
West South Central	17	20	4	12	0	40	17	40	12	40
Mountain	9	0	27	9	18	0	0	9	0	0
Pacific	21	10	21	8	21	0	8	10	18	0

INFLUENZA DEATH RATES

	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928
95 cities	21	24	21	24	25	[2] 19	19	19	24	[3] 17
New England	14	7	5	18	9	7	5	9	2	7
Middle Atlantic	20	21	20	19	22	16	21	14	28	[3] 14
East North Central	16	13	25	17	21	12	9	13	22	10
West North Central	10	14	4	18	4	10	12	10	14	4
South Atlantic	23	37	20	26	49	11	27	23	23	30
East South Central	37	78	16	105	32	[2] 101	58	68	37	42
West South Central	42	66	42	66	72	78	64	45	38	57
Mountain	99	62	54	71	72	80	45	53	72	53
Pacific	14	37	31	17	14	20	7	34	21	20

PNEUMONIA DEATH RATES

	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928
95 cities	179	191	183	179	158	[2] 159	168	150	147	[3] 167
New England	191	179	207	156	158	126	188	126	165	149
Middle Atlantic	204	214	197	193	174	183	197	129	173	[3] 200
East North Central	152	158	138	137	132	121	121	129	128	114
West North Central	124	112	116	137	126	98	135	49	95	106
South Atlantic	189	252	278	231	189	210	222	198	168	224
East South Central	207	225	255	251	213	[2] 171	207	131	117	235
West South Central	178	287	195	306	200	267	149	209	144	201
Mountain	197	168	215	186	170	177	143	203	143	150
Pacific	169	142	134	142	107	145	121	128	114	182

[2] Louisville, Ky., not included. [3] Buffalo, N. Y., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,961,900	2,890,700	2,961,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended January 28, 1928.—The following report for the week ended January 28, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Aden Protectorate.—Aden.
India.—Bassein, Bombay, Calcutta, Rangoon
Ceylon.—Colombo.
Siam.—Bangkok.

CHOLERA

India.—Calcutta, Madras, Negapatam.
Dutch East Indies.—Semarang.
French Indo-China.—Saigon and Cholon.
Siam.—Bangkok.

SMALLPOX

India.—Bombay, Calcutta, Madras, Negapatam, Rangoon, Tuticorin, Vizagapatam.
French India.—Pondicherry.
Dutch East Indies.- Banjermasin, Belawan-Deli.
China.—Hong Kong, Shanghai
Kwantung.—Dairen.
Manchuria.—Changchun, Mukden.

Returns for the week ended January 28 were not received from Samarinda, Dutch East Indies, Canton, China, or Vladivostok, Union of Socialist Soviet Republics.

CANADA

Provinces—Communicable diseases—Week ended February 11, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended February 11, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever				1				1
Influenza	15			3		1		19
Lethargic encephalitis				1		1		2
Poliomyelitis							1	1
Smallpox				51		34	6	91
Typhoid fever		1	15	7			12	35

Quebec—Communicable diseases—Week ended February 11, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended February 11, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	24	Scarlet fever	96
Diphtheria	94	Smallpox	8
German measles	4	Tuberculosis	46
Influenza	5	Typhoid fever	15
Measles	144	Whooping cough	8

CZECHOSLOVAKIA

Communicable diseases—September 1 to December 31, 1927.—During September, October, November, and December, 1927, communicable diseases were reported in Czechoslovakia as follows:

	September		October		November		December	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Anthrax	13	2	3		4	1	8	
Cerebrospinal meningitis	4	1	11	3	8	5	13	4
Diphtheria	682	42	887	55	1,062	89	1,045	107
Dysentery	166	19	77	1	61	15	7	1
Malaria	83		83		6		6	
Paratyphoid fever	21		8	1	7		4	1
Puerperal fever	40	13	30	12	50	20	40	12
Rabies	2	2	2	2	1	1		
Scarlet fever	1,467	31	2,150	31	1,754	40	1,507	30
Trachoma	179		219		247		213	
Typhoid fever	1,083	61	1,126	65	1,006	82	682	45
Typhus fever	6		1				6	

GREAT BRITAIN

England and Wales—Vital statistics, 1927.—The following item is taken from The Lancet of January 21, 1928:

The Registrar General of England and Wales has issued a provisional statement of the figures for birth rate, death rate, and infantile mortality during the year 1927.

	Birth rate	Death rate	Infant mortality rate
England and Wales	16.7	12.3	69
107 county boroughs and great towns including London	17.2	12.3	71
155 smaller towns	16.5	11.4	68
London	16.1	11.9	59

The smaller towns are those with an estimated population in 1921 of 20,000–50,000. The death rate for England and Wales relates to the whole population, but that for London and the two groups of towns to the civil population only. Birth rates and death rates are per 1,000 population; infant mortality rate per 1,000 births.

The registrar general remarks that the birth rate is 1.1 per 1,000 below that of 1926, and is the lowest rate recorded since the establishment of civil registration. The death rate is 0.7 per 1,000 above that of 1926; the excess being due to the high mortality of the first and fourth quarters of the year. The infant mortality rate is equal to that of 1923, the lowest on record; the rate in 1926 was 70 per 1,000 births. These provisional figures, which are not likely to require substantial modification, have been issued for the information of medical officers of health.

GUATEMALA

Plantation sanitary campaign.—According to information received under date of January 20, 1928, the health department of Guatemala has issued regulations relative to a sanitation campaign for improved health conditions on the plantations of the Republic. The operation of the proposed campaign includes: Requirement to maintain medicine chest with equipment for first-aid treatment; employment of a community plantation physician who shall be charged with the duty of regular visits and oversight of prophylactic and hygienic conditions; vaccination against smallpox and typhoid fever required for admission to plantations; maintenance of sanitary privy system; protection of dwellings against mosquitoes; adequate ventilation and removal of sleeping quarters from vicinity of kitchens; requirement that plantation owners keep records of cases of sickness among their laborers, with personal history of patients, duration of illness, date of cessation of labor, recovery, death, etc. Penalties for noncompliance with these regulations are provided in the plan of the campaign.

UNION OF SOUTH AFRICA

Plague (*suspect*)—*Orange Free State.*—Information received under date of January 13, 1928, relative to suspect cases of plague which occurred in natives on two farms in Koffiefontein District of the Orange Free State, Union of South Africa, and were reported during the two weeks ended December 24, 1927, shows that immediately preceding the onset of the illness the patients had caught by hand a hare which was obviously sick.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28
China:																			
Amoy	C	2	28	72	16														
	D		7	3															
Canton	C	8	31	36	14	5	1	6			1								
	D	5	16	25	14	5	1	5			1								
Foochow	C	P	P	P	P														
Hong Kong	C	2	P	1	P														
	D	1																	
Shanghai (settlement and concession)—																			
Foreigners only	C		1	6	3														
Including natives	D		20	74	7														
Swatow	C	72	42	P	P	P	P												
	D	1		P	P	P	P												
Tientsin	C	P	P	15	2	P	P												
Dutch East Indies: Java—Batavia	C						1	2	25	2	1								
	D						1	2	15	2	1								
India	C	46,137	45,163	31,390	20,160	5,303	4,845	5,987	6,912	8,102	5,997	5,766	5,274						
	D	24,081	22,051	15,895	10,371	2,867	2,641	3,350	4 005	4,935	3,672	3,355	3,164						
Bassein	D	16																	
Bombay	C	75	42	3				2											
	D	35	30	2				2											
Calcutta	C	95	87	76	101	28	35	65	71	156	119	87	66	69	42	43			
	D	48	40	39	64	22	25	42	49	106	77	55	43	48	34	27		18	
Madras	C	424	547	59	14			6	7			1					1	1	
	D	204	278	48	8			3	4	1		1					1		
Negapatam	D	2	4																
Rangoon	C	2	1	2	6		1		1	3	1	2	2	1	2			4	
	D	2	1	2	5	1			4	2	1	2	1	1	1				
Tuticorin	C				1						6		2						
	D				1	7	5	10	15		6	6	2						

India (French):																			
Chandernagor	C	1	1	1					6	2	2	2	2	6					
	D	1	1						6	2	2	2	2	4					
Karikal	C	56	18	1			1						1						
	D	45	12	1			1						1						
Pondicherry	C	37	12	15			1				5	3	17	4					
	D	24	11	15			1				5	1	15	6					
Indo-China: Saigon	C			1	1											2	1	1	1
	D															1			
Iraq:[1]																			
Japan: Yokohama	C	1																	
	D	1																	
Philippine Islands: Manila	C	1	1																
Siam	C	81	77	40	18	14	23	43	30	19	29	18	32	24	24	13			
	D	59	53	24	11	10	15	25	26	11	19	13	21	18	21	5			
Bangkok	C	6	2	3	5		1		3		1	1	1	2	3	7	9	11	38
	D	1	1	1	3		1		1		1		1	2	1	3	5	7	16
Straits Settlements: Singapore	C					1		4	2	1	2		2	3	12	3	2	1	
	D					1		4		2			2	1	3	5	2	2	
On vessel:																			
S. S. Adrastus: At Yokohoma, Japan	C		1																
	D		1																
S. S. Tabaristan: At Basra, Iraq	C				1														

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927		
						1-10	11-20	21-30	1-10	11-20	21-31
Indo-China (French):											
Annam	C	911	1,628	640	226	13	75	38	16	2	
Cambodia	C	87	89	75	180	56	1	28	21	12	39
Cochin-China	C	257	68	144	178	21	27	52	17	38	58
Laos	C	20	190	36	67	10					
Tonkin	C	1,093	180	24	1			1			2
Kwangchow-wan	C		1	15							

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths, Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths. The report of 29 cases of cholera with 18 deaths at Baghdad during the week ended July 30, 1927, which appeared in the PUBLIC HEALTH REPORTS Sept. 23, 1927, and in subsequent issues, was erroneous. The director of public health of Iraq states that cholera did not appear at Baghdad in 1927 until Oct. 20.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug 28-Sept. 24, 1927	Sept. 25-Oct 22, 1927	Week ended— Oct. 29, 1927	November, 1927				December, 1927					January, 1928				February, 1928		
							5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18
Algeria: Oran	C		4	1			1		1													
	D		3	1																		
Arabia: Aden	C																19	13	22			
	D																7	8	8			
Argentina:																						
Bahia Blanca district	C									1	1	1										
Buenos Aires	C																				2	
Cordoba Province	C		2		P	P	P			10				1	1							
Entre Rios	C		5																			
Firmat	C												1									
Quilino	C									1	1	1										
Rosario	C									1	1	1	1	2	3				4			1
Santiago Province	C																					1
Ucacha	C											1										
Azores: St. Michaels Island	C	2	2	2	3	1		1	1	1	1	1		1		1		3				
	D			1	1							1					1	1				
Brazil: Rio de Janeiro	C																	2				3
British East Africa:																						
Tanganyiki	C	P	P		P	P	P	P	P	P	P	P	P	P								
Uganda	C	528	456	226	99	54	7	18	40	24												
	D	413	345	158	88	34	9	14	39	21												
Canary Islands:																						
Las Palmas	C				9					1			2			2		1				
Santa Cruz	C																	1				
Teneriffe	C																	1	3			
Ceylon: Colombo	C		1	3	1					1	1		4	3	2	1	1	1	1			
	D			3								2	4	3	1	1	1	1	1			
China:																						
Amoy	C	P																				
Tungliao	D				200																	
Tientsin	C		2																			
Dutch East Indies:																						
Balik-Papan	C													1								
	D													1								

Celebes: Makassar	C						2	2	2	1		1		2	1		3	2				
	D						2	2	2	1		1		2	1		2	2				
Java	D			432	779	191	213	228	197	291	275											
Batavia and West Java	C	40	71	68	130	41	29	31	34	45	43	32	34	32	36							
	D	40	71	68	129	41	29	31	34	44	43	32	33	32	36							
Cheribon	C										1											
	D										1											
East Java and Madura	C	29	28	18	17	3	4	2	1	5	3			3								
	D	29	27	18	17	3	4	2	1	5	3			3								
Pasoeroean Residency	C									P	P	P										
Surabaya Residency	C										P											
Surakarta Residency	C								P	P	P											
Egypt:																						
Alexandria	C		2	1						5	3	2	2	3	2							
	D									5	2			1	1							
Suez	C			1													1	1				
	D																1	1				
Greece:																						
Athens and Piraeus	C		1	3	1										2	1						
	D				1										1							
Mitylene	C		1	5	1	1		2		1	1	1										
Patras	C		2	2	1		1															
	D				1		1															
Hawaii Territory: Hawaii	D		1																			
India	C	404	1,391	2,710	3,246	812	1,015	856	919	1,183	1,228	1,348	1,749									
	D	241	836	1,428	1,792	495	551	485	554	668	742	773	1,085									
Bassein	D	23	12	14	8		1	2	1	3			1	2	13	2		3	3			
Bombay	C	14	14	7	4										1		2					
	D	13	11	5	3										1		1		2			
Calcutta	C			18																		
	D			10															1			
Madras Presidency	C	255	620	465	583	149	83	152	86	190	158	220	223	174	167							
	D	115	321	230	298	63	54	80	85	111	61	108	79	69	27							
Rangoon	C	21	15	6	11	5	2		4	5	2	6	2	2	4	4						
	D	20	14	6	11	5	2		4	5	2	5	3	2	3	4	7		7			
Indo-China: Saigon	C			2					1													
Senegal:																						
Baol	C	41	23	72	95				P		P											
	D	22	13	33	40																	
Cayor	C	126	227	463	176	32	8	8	P													
	D	74	166	233	88	20	4	4														
Dakar	C	67	46	20	1																	
	D	41	32	12																		
Louga	C			5	8																	
	D			4																		
M'Bour	C	28																				
	D	23																				
Rufisque	C	104	44	16																		
	D	82	38	12																		
Thies	C	7		9	1	1																
	D	3		7																		
Tivaouane	C	43																				
	D	29																				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C, indicates cases, D, deaths; P. present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct 22, 1927	Week ended— Oct 29, 1927	November, 1927				December, 1927					January, 1928				February, 1928		
							5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18
Siam	C				13					2			1	1	7	4						
	D				9		1			1			1	1	1	5						
Bangkok	C				2										1							
	D						1								1							
Straits Settlements. Singapore	C								1													
	D								1													
Turkey: Constantinople	C			1	1					1	1											
	D				1						1											
Union of South Africa Cape Providence	C					2						2										
	D					2						1										
Orange Free State	C	4							1	8	P											
	D	4							1	6												
U. S. S. R.: Chita district	C				1																	
	D				1																	
Northern Caucasus	C			14	1																	
	D			10																		
On vessel: At La Plata, from Rosario, Argentina	C														1							
S. S. Aghios Gerasimos at Vigo, Spain	C								3													

Place		July	August	September	October	November	December
Algeria: Algiers	C				2		
British East Africa: Kenya	C	13	61	21	18	28	16
Ecuador: Guayaquil	C	5	7	3	4	9	5
	D					3	2
Indo-China (French)	C			14	3	3	
Madagascar	C	46	98	170	166	209	317
	D	43	89	154	155	189	261
Ambositra Province	C	6	1		6		
	D	6	1		6		
Antsirabe Province	C		34	5	19		
	D		34	4	19		
Itasy Province	C	14	11	21	16		
	D	14	7	20	15		

Place		July	August	September	October	November	December
Madagascar—Continued.							
Moramanga Province	C	5	4	3	24		
	D	5	4	3	20		
Tananarive Province	C	21	48	142	99		
	D	19	43	127	93		
Mauritius	C			1			
Nigeria	C	9	8	15	27	16	
	D	7	8	14	27	16	
Peru	C	8	11	15	14	6	14
	D	7	6	6	5	2	4
Callao	D	3					
Lima	C						7
	D				1	1	1
Syria: Beirut	C			1	1		

Indo-China (French), 3 cases, Dec. 11-20; Beirut, Syria, 1 case, Dec. 1-10.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 3–30, 1927	July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927				December, 1927					January, 1928				February, 1928	
							5	12	19	26	3	10	17	24	31	7	14	21	28	4	11
Algeria	C	376	459	382	683		294	218	149		68	55	47	81	26						
Algiers	C												3	3	4		2	3	1		
Oran	C	14	9	16	11		10	4	6	9	11	10	9	8	15	2	4	2	2		
Arabia: Aden	C	2							1		1	1	1	1							
	D	1																			
Brazil:																					
Para	C		1																		
Rio de Janeiro	C	4	6	10		1															
	D	4	4	9		1															
British East Africa: Tanganyika	D		21	8	P	P	P	P	P	P	P										
British South Africa:																					
Northern Rhodesia	C	48	55	39	164	150	10	22	3	57	15	125	55	2	81						
	D	2	1	2	11	40	23		1	18	7	28	9		8						
Southern Rhodesia	C								3				2	1							
Canada:																					
Alberta	C	42	17	17	23	6	2	1	1	7	3	3	6		3	3	5	1	19	1	6
Calgary	C	5																			
Edmonton	C				1	1				6		1	1			3	2	1			
British Columbia: Vancouver	C			2								4		1	3	3	1	11	3	1	
Manitoba	C		13	9	7	3	14		2	1	3	1	2	2	2	2	5		1		
Winnipeg	C	3	5	4	2				2			1	1	1			1	1	1		
New Brunswick	C			2										1							
Nova Scotia	C			1	1																
Halifax	C				1																
Ontario	C	63	60	22	96	64	38	77	85	71	90	82	104		58	83	76	52	77	63	51
Hamilton	C										2										
Kingston	C								1					1							1
Ottawa	C	37	27	40	67	47	17	51	19	10	19		34	18	9	20	23	20	16	23	9
Toronto	C	5		2	10	2	16	3	13		25	14		7		11	10	8	5	1	6
Windsor	C				9																
Quebec	C	12	1		8	7	3	12	3	8	5	3		14	3	10	17	7		11	11
Montreal	C							1	[illegible]					1		1	6	3	4	1	
Quebec	C										2		2		2		3		5		
Riviere du Loup	C								3												

Saskatchewan	C	25	14	68	31	5	12	2	14	9	15	19	15	12	13	15	12	39	15	9	34
Moose Jaw	C		10	16	3								1		1	2	1	4	2	3	2
Regina	C	2	8		5			1					1								
Saskatoon	C											2			4			13	1		1
Ceylon: Colombo	C		1					1			2										
	D		1								1										
China:																					
Antung	C	3															1				
Canton	C			1																	
	D			1																	
Chefoo	C			1	P					P											
	D			1																	
Foochow	C	P	P	P	P		P			P		P	P	P	P						
Hong Kong	C	3	1	2													1	1			
	D	3	1	2												1					
Manchuria—																					
Changchun	C	4								1									4		
Dairen	C				1		2						1								
	D				1																
Fushun	C	1		1				1													
Harbin	C	1											2		1						
Mukden	C	3			2	1													1		
Pensihu	C	1			1																
Tientsin	C	11		4	13	8				4	1	2	2	2							
Curacao (Alastrim)	C																	2			
Dutch East Indies:																					
Borneo—																					
Samarinda District	C					P															
South and East Borneo Residency	C		P																		
Java:																					
Batavia and West Java	C	2	4		4			25													
	D							15													
East Java and Madura	C	8	4	22	8	1	3	5		4	3	2									
	D				1																
Sumatra: Medan	C												3		8						
	D												2		1						
Egypt	C	4		3							4			4							
	D			1	1							1									
Cairo	C										1										
Great Britain:																					
England and Wales	C	721	568	508	47[illegible]	199	219	258	226	233	366	230	212	255	247	275	398	405	370		
Birmingham	C		1		1													14	17		
Bradford	C					1	5	3	2	9	6	2	2	2	2	4	24	6	9		
Bristol	C				6	1			3	2	4	2							2		
Cardiff	C					1										1					
Leeds	C	2	5	3	7	1	1	1	2	3	3	6	4	4	6	1		1			
Liverpool	C																1				
London	C																	2			
Manchester	C				3		1	1	4	2	5	10	8		1	2	2	11	6	4	
Newcastle-upon-Tyne	C	1	1	2	6	2	6		1	28	18	5	4	2	13	2	5	14	3		
Nottingham	C															7	6	4	8		
Sheffield	C	11	2	1	10	4			2	1	8			3		1	10	4			
Stoke-on-Trent	C		1													3	1			1	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3–30, 1927	July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11
Greece: Saloniki	D	1	2																		
Guinea (French): Beyla	C	9																			
India	C	11,340	5,911	4,398	3,153	779	805	1,235	1,233	1,031	1,556	1,939	2,205								
	D	3,140	1,668	1,120	715	190	200	211	326	307	359	465	519								
Bassein	C		1																		
	D		1																		
Bombay	C	38	33	12	10	2		2			4		5		4	4	6	10	23		
	D	21	19	8	2	2		1			1		1					2	8		
Calcutta	C	93	27	22	5				5	4	3	11	7		17	9	14	14	11		
	D	70	25		6				2	2	1	6	2		17	4	6	10	7		
Madras	C	4	6	7	8	3		2	2	2	2	5	2	2		11	8	9	16		
	D	1		2		1		1		1	1	1		1		4	1	3			
Negapatam	C	3	3	1													5		4		
	D	2	2	1													3		2		
Rangoon	C	37	14	9	17	4		1	1	5	2	1	6	36	28	23	49	41	34		
	D	11	3	2	3	1				1	1		2	5	13	4	9	13	10		
Vizagapatam	C	11		3												3		2	1		
	D	4		2														6	1		
India (French):																					
Karikal	C	2	3	1	2		P														
	D	2	3	1	2																
Pondicherry	C	22	29	37	38	9	10	13	10	15	6	6	14	6							
	D	20	31	37	38	9	10	13	10	15	6	6	14	6							
Indo-China: Saigon	C	1	1	1									1		1	1	1				
Iraq:																					
Baghdad	C			1	7			5		1	5	7	12	9	9		2				
	D			1	4			4			5	4	5	7	3						
Basra	C	1	1	4	2				3		2	2			2						
	D	1	1	4	2				1		2	1			1						
Italy: (Rome and vicinity)	C	1		1																	
Jamaica (outside Kingston) (alastrim)	C	15	6	9	9	7				1		1	1		2				4		
Kingston	C			3	2																
Japan: Nagasaki	C	17	2																		
	D	5	1																		

Mexico:																					
Acapulco	C			2				1													
	D			2				1													
Chihuahua	D															1					
Guadalajara	D									1			1								
Manzanillo	D																1				
Mexico City and surrounding territory	C									1	1	1	1								
Monterey	C	6																			
	D	4																			
San Luis Potosi	D	4	1																		
Torreon	D		1		2																
Palestine: Jerusalem	C										1										
Paraguay	D	2																			
Persia: Teheran	D	2																			
Poland	C	7	2										1	5							
	D	2	1																		
Portugal:																					
Lisbon	C	4		3	8	1	2		1		3	3	4	1	2	4	5	5	2		
	D												1								
Oporto	C			1																	
Siam	C	34	31	27	6				1		8		1	2	5	8					
	D	9	10	15									1			2					
Bangkok	C	5		3					1		1				1	2					
	D	1		1												1					
Spain:																					
Malaga	D								1	1											
Seville	C																1				
Valencia	C				1										1	1					
Straits Settlements: Singapore	C							1													
Switzerland	C													2							
Tunisia: Tunis	C														1	2					
Union of South Africa:																					
Cape Province	C	P	P		P																
Orange Free State	C		P						P	P	P	P	P	P							
Transvaal	C				P	7															
Venezuela: Maracaibo	D	1		2	1																

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928	
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Algeria	C	376	459	382	682								
Oran	C	14	10	16	11								
Indo-China	C	19	3	21	25	13	3	22	10	4	20		
Syria:													
Aleppo	C										1		1
Beirut	C								1		1		
Damascus	C		3	5	22		13		4	6	2	11	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July	August	September	October	November	December
Angola	C	42	2	5	73		
	D				2		
Congo	C			5	77		
Cuanza-Norte	C			1			
Cuanza-Sul	C				2		
Loanda	C			1			
Zaire	C			3	4	1	
Brazil: Porto Alegre	C	5	3	3	4	1	
British East Africa: Zanzibar	C				2		
	D				1		
Chosen	C	19	2		2	2	
	D	6				1	
Ecuador, Guayaquil	C		2	2	1	1	4
France	C	23	6	8	7	4	14
Gold Coast	C	1	1	5	4		
Greece	C	3	3	4	4		1
Latvia	C				2		
Mexico	D	93	73	55			
Morocco	C	53	76	51	81	140	401
Nigeria	C	492	91	237	223		
	D	83	20	70	51		
Persia	D					2	
Spain: Madrid	D					1	
U. S. S. R.:							
Railways, etc	C	11	6	9			
Other territories in Europe	C	146	111	190			
Transcaucasus, Siberia, and Central Asia	C	36	29	15			
Ukraine	C	16	4				

TYPHUS FEVER

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28
Algeria: Oran	C													1	1	1	1		2
Bulgaria: Sofia	C				17	3	1	2					1	1	4	1		1	
	D						1												
Chile:																			
Antofagasta	D	1			1														
Talcahuano	D	1																	
Valparaiso	C	2		1				1		1	1						1		
	D		2	1				1	1										

China:																			
Manchuria—Harbin	C	3	2					1											
Tientsin	C	1		2															
Egypt	C	24	2		12		4			1	7	3	3	1					
	D	1	3		5						5	1	2						
Port Said	C				1						1								
Ireland (Irish Free State):																			
Cork County	C	1										3				1			
Donegal County, Letterkenny	C				4														
Mexico:																			
Guadalajara	D									1									
Mexico City, including municipalities in Federal District	C	16	17	19	18	9	6	2	11	7	6	4		4	4	4	3	2	1
	D						2						1	1	3	1			
Morocco	C															107	235	257	
Palestine:																			
Haifa	C		4		2				1	1									
Herzlia	C									1									
Jaffa	C		2		1					1									
Nazareth	C	1	2						1										
Safad	C	1	2							1		1							
Tel-Aviv	C		1	1	2				1	1	1								
Poland	C	99	50	35	19	35	12	6	11	13	28	17	35	26	33	68			
	D	10	6	2	4	6	3		2	1	5		4	1	3	6			
Portugal: Oporto	C		1			1								1					
Rumania	C	27	36	16	17		11	9	2	6	8	8	13						
	D	4	1		2														
Syria: Aleppo	C			2												2			
Tunisia	C	29	14	1	3			1					1	1			5	4	
Union of South Africa:																			
Cape Province	C	P	P	P	P		P	P	P	P	P	P	P	P	1	P			
Natal	C	P	P	P	P		P	P	P	P	P	1	P	2	P	P			
Orange Free State	C	P			P							P							
Transvaal	C	18	1		5		P	P	P	P	P								

Place		1927: July	August	September	October	November, 1927: 1-10	11-20	21-30	December, 1927: 1-10	11-20	21-31
Algeria	C	67	33	10	12						
	D	13			1						
Algiers	C	2	2	6	2						
Bulgaria	C	12	24	7	2						2
	[illegible]		1	2	1						1
Morocco	C	148	76	7	11	5	14	7	5	6	75
	D										

TREASURY DEPARTMENT

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SPECIAL ARTICLES

Current World Prevalence of Communicable Diseases

Health of University Students as Related to Tonsillectomy

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PREVALENCE OF DISEASE

PUBLIC HEALTH REPORTS

VOL. 43 MARCH 9, 1928 NO. 10

MONTHLY REVIEW OF WORLD PREVALENCE OF COMMUNICABLE DISEASES [1]

United States, January 1–February 11, 1928

Health conditions during the first five weeks of 1928 were exceptionally favorable. The mortality in 66 large cities during these weeks was 13.7 per 1,000 population (annual basis), as against 14 in the corresponding weeks of 1927, which was also an unusually good health year. Not since 1921 has the January mortality in large cities—and conditions in these cities may be considered a fair index of conditions in the country as a whole—been as low as in the current year. The seasonal maximum occurs, as a rule, toward the end of February or in March, so that although the present outlook would seem to indicate a generally healthful winter, there may be some increase in mortality in the next few weeks.

Influenza.—Influenza had shown only a normal seasonal increase in most parts of the country up to the end of January. Cases of this disease, which is not very well reported, were even less numerous than in January, 1927, except in a few Southern States. The total number of deaths from influenza and pneumonia, which are a better index of the prevalence of any serious respiratory affection, but which are available for less recent date than the reported cases, gave approximately the same mortality rate for 95 cities during December and the first three weeks of January as a year ago. For the cities in the northern and western sections the average mortality from these causes in the first three weeks of the year was about the same as or lower than a year ago, but in the South Atlantic, East South Central, and, especially, in West South Central States the average mortality in the cities was somewhat higher. There was no indication, however, of any epidemic of respiratory diseases.

Smallpox.—Smallpox has been somewhat more prevalent in recent weeks than in the corresponding weeks of the preceding two years.

[1] From the Office of Statistical Investigations, United States Public Health Service.

There is no indication that any of the outbreaks have been virulent in type. The cases reported by 42 States were as follows:

Week ended [1]—	Corresponding week of—		
	1926	1927	1928
Jan. 7	810	781	815
Jan 14	894	853	1,274
Jan. 21	977	908	1,151
Jan 28	846	983	1,125
Feb 4	1,021	1,017	1,2[illegible]
Feb. 11	1,081	839	1,068

[1] Dates are for the year 1928.

The increase in smallpox cases has occurred chiefly in the West Central and Mountain States, particularly in Kansas, Iowa, and Oklahoma. Marked improvement in the smallpox situation is indicated for most Southern States. In Georgia no cases had been reported in the first five weeks of the current year, as against 385 in January, 1927; in Florida 22 cases had been reported in the same period, as compared with 169 in January a year ago; in Alabama 25 cases had been reported, as compared with 241. In North Carolina smallpox has been prevalent for several years, and in the current year the number of cases has increased markedly; 590 cases were reported in the first five weeks, as against 276 in January, 1927, and 156 in January, 1926. An unusual outbreak of smallpox in Connecticut is indicated; 120 cases were reported up to February 4, although the State has been practically free from this disease for several years.

Scarlet fever.—Scarlet fever has shown only the normal seasonal increase in incidence. Up to February 4 there had been fewer cases reported than during the corresponding season one year ago, and approximately the same as the number reported two years ago. The decline as compared with last winter is very general, only three States having reported more cases than in the same period a year ago. The States reporting more cases in the present year are Nebraska, Iowa, and Rhode Island, but in none of them has there been any unusual epidemic prevalence. The seasonal maximum usually is not passed until the end of February or early in March, but there is nothing to indicate that any marked increase should be expected in the present year.

Diphtheria.—The number of diphtheria cases reported during January by 41 States corresponded very closely with the number reported in the same month a year ago; in both years the January incidence was slightly higher than in January, 1926. In most States the number of cases reported in the early weeks of the current year did not differ significantly from the number reported last year. States

showing a somewhat higher incidence in the present year include Connecticut, District of Columbia, Illinois, Kansas, Louisiana, New Jersey, New York, Pennsylvania, and Texas.

Measles.—Measles cases increased rapidly during January; 41 States, including the District of Columbia, reported 6,674 cases in the week ended January 7, but these same States reported 12,730 cases in the week ended February 4. The incidence in the present year has been slightly above that a year ago, but about the same as that of two years ago. This disease is epidemic every second or third year in most localities and, therefore, over the country at large in any year it may be expected to be epidemic in a certain number of States. The seasonal maximum probably will not be reached until late in the spring; present indications are that it will be more epidemic in the current year than last year, but it is too early to tell whether or not the incidence will be as high as in 1926.

Poliomyelitis.—New cases of poliomyelitis reported during January and the early part of February continued above the level of reported cases for the corresponding period of the preceding two years, but the number was gradually declining. The largest number of cases was reported in California (17 cases in the week ended February 4); other States reported only sporadic cases.

Typhoid fever.—Typhoid fever was more prevalent than a year ago in the South and Central States and less prevalent in other sections of the country, but the incidence is low at this season of the year.

Foreign Countries[2]

The mortality rates in a large number of European towns showed only a slight seasonal increase in November and December. There was no indication that the mortality was disturbed by any serious epidemic situation. In a few cities for which data for December were complete the increase was marked but not unusual. For example, in 16 Scottish towns the death rate in the four weeks ended December 31 was 18.6 per 1,000 (annual basis), as against 14.7 in the preceding four weeks; in Dublin, the death rate was 18.1, as compared with 14.6 in the preceding four weeks; the average death rate in 107 English towns for four weeks in December was 14.1, as against 11.3 in the preceding four weeks.

The following information on the prevalence of specific diseases has been taken from the League of Nations' Monthly Epidemiological Report.

Cholera.—The cholera epidemic in Iraq came to an end in December, after lasting five months. During this period 1,479 cases and 1,063 deaths were reported. In the previous epidemic in 1923 there

[2] Data from Monthly Epidemiological Report of the Health Section of the League of Nations' Secretariat, Jan. 15, 1928, supplemented by information published in the Public Health Reports.

were 1,640 cases and 1,097 deaths. More cases occurred in the districts along the Euphrates River in the recent epidemic than in 1923, but the incidence in Basrah and Abadan was much lower, and the city of Baghdad had almost complete immunity in 1927, with only 7 cases reported.

In India cholera was abnormally prevalent in November for the time of year The disease was particularly epidemic in Bengal and increased also in Assam, Bihar, and Orissa, and in Madras Presidency. The number of deaths reported in the various provinces is shown in the accompanying table. The serious epidemics in Bombay Presidency, Hyderabad, and the Central Provinces, which reached their maximum in August and September, had nearly come to an end in November.

In French Indo-China cholera cases have decreased rapidly since July. In Tonkin, only 3 cases occurred in the last quarter of 1927. Laos was free from cholera from November 10 to the end of December. In December, Annam reported 18 cases, Cambodia 72 cases, and Cochin-China 113 cases.

Cholera infection in ports of the Far East had decreased very markedly at the close of 1927. In the first two weeks of January, 1928, Calcutta reported 43 deaths, Bangkok (16 cases), Singapore 5 cases, Saigon 3 cases, and Rangoon and Moulmein each reported 1 case.

Cholera deaths reported in the Provinces of India from August 14 to December 3, 1926 and 1927

Province	1926				1927			
	Aug. 15 to Sept. 10	Sept. 10 to Oct. 9	Oct. 10 to Nov. 6	Nov. 7 to Dec. 4	Aug 14 to Sept. 10	Sept. 11 to Oct. 8	Oct. 9 to Nov. 5	Nov 6 to Dec. 3
Punjab and Delhi	36	21	0		641	184	2	0
Punjab States	0	1	0	0	46	172	45	10
United Provinces	430	263	372	164	865	382	190	36
Bihar and Orissa	3,154	1,093	572	497	3,510	1,388	905	1,586
Bengal	424	511	913	2,294	1,208	2,234	5,596	8,821
Assam	25	15	0	17	587	601	1,215	1,815
Central India Agency	0	1	0	0	929	92	17	8
Central Provinces	603	621	573	88	4,562	2,782	864	304
Madras Presidency	980	866	678	1,139	2,523	1,136	1,061	2,509
Hyderabad	10	6	0	0	3,089	1,274	579	151
Bombay Presidency	1	0	1	26	3,220	945	518	87
States in Bombay Presidency	1	0	0	0	60	107	22	0
Burma	332	209	162	325	181	195	264	480
Other Indian States	5	63	0	0	31	7	16	65
Total	6,001	3,670	3,271	4,550	21,475	11,499	11,294	15,954

Plague.—The plague incidence in Egypt in 1927 was the lowest on record since the introduction of plague into Egypt in 1899; a total of 79 cases was reported. Twelve cases which occurred at Alexandria between the middle of November and the end of December were the only cases reported in 1927 after September 4.

No case of plague had been reported in Tunis since last July, and none in Algeria since November 17. Greece reported two cases on the island of Mytilene early in December and one case at Piræus on January 3.

Three plague cases occurred at Las Palmas, in the Canary Islands, on December 15. Early in January there were two further cases, and a third case on January 15. One case was reported at Santa Cruz de Teneriffe on January 12.

No plague case has been reported in Senegal since the first week in December. This is the usual quiescent period for plague in Senegal, which lasts until March. In Nigeria the plague situation is much more favorable than it was in the three preceding years. Seventeen cases were reported at Lagos and 3 at Ijebu during the four weeks ended December 31; 67 cases were reported in these two localities in December, 1926. There were 7 cases at Lagos during the first two weeks of January, 1928.

There seems to be a halt in the annual increase of plague in Madagascar, which has been continuous since the introduction of the disease in 1921. The monthly number of cases reported has been lower than in the corresponding month of the preceding year for each month since August, 1927. During the month ended December 15, 1927, there were 243 cases, as compared with 314 during the corresponding period of the preceding year. The maximum prevalence usually occurs between December and February.

Plague was more prevalent in Uganda in 1927 than in any year since 1921; 1,704 deaths from plague were reported from the beginning of the year up to November 26. During the previous five years the reported annual plague mortality has ranged between 535 (in 1924) and 1,608 (in 1926). The maximum prevalence occurred in August. Plague has diminished in Kenya since 1925.

The plague outlook in India remained favorable in November. Returns for the Punjab are very low in comparison with previous years. In Bihar and Orissa, which was practically free from plague from June to the end of October, 51 cases were reported during four weeks ended December 3. The incidence of plague was likewise lower than in previous years in the United Provinces up to the middle of November, since which time there has been an increase which is somewhat rapid for the season. There was as usual an increased prevalence of plague in November in the State of Hyderabad and in the Central Provinces. The normal seasonal maxima of plague in the Bombay and Madras Presidencies (excluding the city of Bombay) as well as in Mysore are passed. Plague was rapidly decreasing in the Madras Presidency during the second half of November, except in the district of Madura, in the extreme south,

where the disease is markedly more prevalent than in the three preceding years.

Bubonic plague appeared in Aden on January 9, 1928, on which day 19 cases were reported. Since the outbreak of 1917, indigenous plague had not been reported from Aden until the present outbreak.

Yellow fever.—The yellow-fever situation on the Guinea coast has considerably improved. Only 6 cases were reported at Dakar in December; Senegal was free. The last case occurred during the week ended December 27, and Dakar, as well as Senegal, was declared free from yellow fever on January 6, 1928.

No case of yellow fever has been reported in the Gold Coast Colony since October. The number of cases reported during the year has been considerably higher, however, than during any year since the reappearance of yellow fever in this area. There was 1 case of yellow fever during the last week of December at Abidjan on the Ivory Coast, where the disease had not been reported since August. No case has been reported in Dahomey since November 21, nor in Nigeria since September.

An outbreak of yellow fever occurred at Matadi, in the Belgian Congo, during the week ended December 23; 3 cases (2 fatal) were reported. An additional fatal case occurred on a steamer at Boma. A few suspected cases have also been isolated.

Smallpox.—Smallpox has been less prevalent in England and Wales than it was last winter. During the four weeks ended January 7, 1928, there were 989 cases, as compared with 1,371 cases during the corresponding period of the preceding year There was, however, a marked increase in the number of cases during the second week of January 1928, when 398 cases were reported. There appears also to have been some spread of the disease, as cases were reported in 17 counties during that week. The large majority occurred, however, in Durham and Yorkshire in the north and in Monmouthshire and Glamorganshire in South Wales

In Spain, where the incidence had been much lower than in previous years, a new increase occurred in the autumn; 18 deaths were attributed to smallpox in September and 34 in October, as compared with only 3 during each of the corresponding months of the preceding year.

The serious epidemic in Algeria began to decrease in December. Only 9 cases were reported during the first week of January, 1928—all in the department of Oran. The total number of cases reported in Algeria in 1927 was 4,305, as compared with 2,473 in 1926, 1,747 in 1925, 483 in 1924, and 141 in 1923. Smallpox incidence, on the contrary, was comparatively low in December in both Tunis and Egypt. It spread in Morocco, where the number of cases increased from 51 in September to 401 in December.

The incidence of smallpox in India increased as usual in November, but was lower than in the preceding year; 1,556 cases were reported during the week ended December 3, as compared with 2,423 during the corresponding week of 1926.

Enteric fever.—Enteric fever was more prevalent in England and Wales in 1927 than in either 1925 or 1926; and the seasonal maximum was not reached until the latter part of November, which is unusually late. In 1925 the maximum occurred in August, and in 1926 it occurred in September.

The maximum incidence occurred earlier in 1927 than in 1926 in France, Italy, Hungary, and in the Kingdom of the Serbs, Croats, and Slovenes. In Italy the incidence in September was much in excess of that of the preceding years, but in October the cases were fewer than in the corresponding month of 1926.

In Poland, Czechoslovakia, and Belgium the incidence of enteric fever was higher in September, October, and November of 1927 than it had been in the corresponding period of 1926.

Enteric fever was considerably more prevalent in Egypt during the late summer months than it had been in 1925 or 1926.

In Japan the number of cases of enteric fever reported in the latter half of 1927 was slightly higher than in the same period of 1926, but in the first quarter of 1927 the cases were much fewer.

Influenza.—No indication of the approach of any serious influenza epidemic in European countries was noted in either the notifiable disease reports or the mortality statistics for large towns which had been received by the health section of the League of Nations up to the middle of January.

The number of deaths attributed to influenza in large towns of England and Wales increased gradually from the beginning of December, but the increase was slow and there were none of those sudden jumps which usually announce the onset of an epidemic. The influenza deaths in 107 towns increased from 63 during the week ended December 3 to 155 during the week ended January 7.

The seasonal increase, in December, of deaths attributed to influenza in 49 large towns of Germany was also very slow—189 deaths during the four weeks ended December 31 as compared with 116 deaths during the preceding four weeks.

Deaths from influenza in towns of Scotland and northern Ireland were more numerous during December and the first half of January than last winter. In 16 Scottish towns 63 deaths were attributed to influenza during the four weeks ended January 14, 1928, as compared with 47 deaths during the corresponding period of last year.

In nine towns of northern Ireland there were 31 deaths from influenza during these four weeks, as compared with 18 deaths during the corresponding period of 1926–27.

Nine deaths from influenza were reported in 11 towns of the Irish Free State during the four weeks ended January 14, 1928, the same number as reported during the corresponding period of the preceding winter.

There was practically no increase from November to December in influenza cases notified in Denmark or Finland.

In France information is available for the cities of Paris and Lyons. In Paris 23 deaths from influenza were reported in December, as compared with 332 deaths during the corresponding month of 1926. At Lyons there were 7 deaths from influenza in December, as compared with 19 in December, 1926.

Statistics for various other large towns show no high prevalence of influenza during the first week of January.

Encephalitis lethargica.—No noteworthy outbreak of this disease was reported in December. The number of cases reported in England and Wales increased from 106 during the four weeks ended December 3 to 134 during the four weeks ended December 31, but both returns were lower than the corresponding figures for the preceding three years. Since the maximum was passed in 1924 there has been a steady decrease of the annual number of cases of encephalitis lethargica in England and Wales and in Scotland. The decrease has been continuous in Sweden and in Switzerland since 1923. The highest annual total was reported in Switzerland in 1920 and in Sweden in 1921.

Cases of encephalitis lethargica reported in various European countries, 1923–1927

Country	1923	1924	1925	1926	1927
England and Wales	1,025	5,039	2,636	2,367	1,617
Scotland (towns)	-------	631	206	194	130
Denmark	87	107	150	70	116
Sweden	536	301	198	153	129
Netherlands	------	35	120	85	101
Switzerland	203	87	71	36	22
Italy	255	617	681	450	[1] 246
Czechoslovakia	366	97	189	54	[2] 68
U. S. S. R.	920	1,990	2,093	2,272	[3] 1,045

[1] 10 months. [2] 11 months [3] 9 months.

Poliomyelitis.—The poliomyelitis outbreaks that occurred in Europe during the autumn of 1927 have decreased rapidly during the last two months. In Germany, where a weekly maximum of 240 cases had been reached in September, there was an average of 20 cases a week during the last three weeks of 1927. The total number of cases reported during the year was 2,742, and the number of deaths attributed to poliomyelitis was 296, as compared with 1,614 cases and 171 deaths during the preceding year and 386 cases in 1925.

In Austria 145 cases were reported in 1927, in comparison with 36 cases the preceding year.

The total number of cases reported was lower in 1927 than in 1926 in England and Wales, in France, and in Denmark. In Sweden the number of cases reported in 1927 was slightly higher than in 1926, but much lower than in the preceding two years.

The incidence was above normal also in Canada, where 309 cases were reported in November and 164 in October, as compared with 26 and 35, respectively, during the corresponding month of the preceding year.

Diphtheria.—Diphtheria was more prevalent everywhere in Europe during the last quarter of 1927 than during the corresponding period of the two or three preceding years, with the sole exception of the Union of Socialist Soviet Republic, where the high prevalence during the two preceding years has remained about the same. The increase was general in all countries from the far north to the extreme south of Europe, and was noted also in countries of the Mediterranean coast of Africa. It did not occur in the form of sudden epidemics, but consisted in a slow and mostly moderate increase of the incidence, beginning in late summer or in autumn, which reached its maximum in most countries in November.

The prevalence in the fourth quarter of the last three years is shown below for England, Germany, and France.

	England and Wales	Germany	France
Fourth quarter 1925	13,771	8,842	2,849
Fourth quarter 1926	14,653	8,684	3,708
Fourth quarter 1927	18,160	10,646	4,309

Scarlet fever.—Scarlet fever, in contrast with diphtheria, shows no general movement common to all European countries. There was a decreased prevalence in the fourth quarter of 1927 in most European countries as compared with the preceding year, but the incidence increased, on the other hand, in England and Wales, Norway, Denmark, Germany, Austria, Italy, the Kingdom of the Serbs, Croats, and Slovenes, and Bulgaria. The increase was considerable in Germany, where 29,934 cases were reported during the fourth quarter of 1927, as compared with 21,816 and 11,793, respectively, during the corresponding periods of 1926 and 1925, and in the Kingdom of the Serbs, Croats, and Slovenes, where the number of cases reported during the fourth quarter of the year increased from 2,917 in 1925 and 1,828 in 1926 to 4,883 in 1927. In most countries the maximum prevalence was reached in October, but in some not until November.

THE HEALTH RECORD OF UNIVERSITY STUDENTS AS RELATED TO TONSILLECTOMY

By Warren E. Forsythe, M. D., Dr. P. H., *Professor of Hygiene and Public Health, University of Michigan*

The improvements so frequently seen to follow well-advised tonsillectomy seem to justify the supposition that a significant difference might be demonstrated between groups of persons having, and those not having had the operation. In an attempt at studying that question, the experience of the University of Michigan Health Service has been drawn upon. For several years the department has examined entering students, cared for their subsequent illness, and collected considerable data.

In an effort at evaluation of the tonsillectomy, the records of two classes have been analyzed. Students entering without tonsils have been compared with those entering with tonsils in place. The accompanying tabulations give comparisons on many points for the two groups.

Table 1.—*Comparison of health items in men students who have and have not had tonsillectomy in the class of 1926—entrance year, fall of 1922*

Items compared	Tonsil status: Tonsils in		Tonsils out	
	Number	Per cent	Number	Per cent
Number of persons studied	703	72	275	28
Entrance examination				
Nervousness, fears or dreads (history)	149	21	58	21
Weight over 140 pounds	321	47	128	49
General health:				
Good	658	95	262	95
Fair	27	3.9	12	4.4
Poor	2	.3	0	0
Posture:				
A	37	6	14	6
B	154	25	71	30
C	345	57	124	53
D	74	12	26	11
Teeth:				
Good	430	63	170	62
Fair	223	32	80	32
Carious cases	102	16	38	14
Devitalized (1 or more) history	321	49	115	45
Nutrition :				
Good	440	67	186	72
Fair	208	32	68	26
Poor	11	1.6	3	1.2
Goiter:				
None	557	88	230	90
Small	66	10	22	8.7
Medium	8	1.2	2	.8
Large	1			
Varicocele	31	4.8	13	5.2
Phimosis	16	2.4	4	1.6
Hernia	12	1.8	10	4
Hemorrhoids	11	1.7	6	2.4
Acne:				
Marked	15	2.3	3	1.2
Slight	58	9	31	12
Vision under 20/20 ou	127	19	59	23
Deviating septum	92	14	31	12
Albuminuria	15	2.4	8	3.1

TABLE 1.—*Comparison of health items in men students who have and have not had tonsillectomy in the class of 1926—entrance year, fall of 1922*—Continued

Items compared	Tonsil status			
	Tonsils in		Tonsils out	
	Number	Per cent	Number	Per cent
Entrance examination—Continued				
Health grade:				
A	45	6.8	20	11
B	444	66.5	173	66
C	167	25	54	20
D	10	1.5	5	1.9
Cervical adenopathy	189	29	16	6
Observed illness (4 years' records)				
No illness record	208	30	79	29
Dispensary calls only, 5 and under	310	44	114	41
Dispensary calls only, over 5	141	20	64	23
Room calls	44	6.3	18	6.5
Infirmary patients	59	8.4	23	8.4
Infirmary days	255	36	111	40
Mean percentages [1]				
Favorable items		96		98
Unfavorable items		27		26

[1] The percentages for favorable and unfavorable items above are averaged to give single figures for comparison.

TABLE 2.—*Comparison of health items in women students who have and who have not had tonsillectomy in the class of 1926—Entrance year, fall of 1922*

Items compared	Tonsil status			
	Tonsils in		Tonsils out	
	Number	Per cent	Number	Per cent
Number of persons studied	391	67.5	187	32.5
Entrance examination				
Dysmenorrhea	207	55	90	52
Teeth devitalized (history)	158	46	74	44
Weight over 110 pounds	216	66.5	117	72
Nutrition:				
Good	317	81	153	83
Fair	62	16	29	16
Poor	8	2	3	1.6
Goiter:				
None	235	69	156	71
Small	87	26	85	22
Medium	14	4	8	5
Large	3	1	2	1.3
Observed illness (4 years' records)				
No illness records	126	32	63	35
Dispensary calls only, under 5	168	44	78	42
Dispensary calls only, 5 and over	60	16	23	12
Room calls	33	8	21	11
Infirmary days, none	356	92.5	175	95
Infirmary days, 1 or more	29	7.5	10	5
Health, grade A	224	59	101	57
Health, grade D	141	37	70	39

TABLE 3.—*Comparison of history items in men students in the class of 1929—Entrance year, fall of 1925*

History items	Tonsil status			
	Tonsils in		Tonsils out	
	Number	Per cent	Number	Per cent
Number of persons studied	[1] 986	65	[2] 537	35
Home district (selected):				
Michigan	532	64	297	36
New England	94	68	20	27
Pacific coast	16	67	8	33
South	21	64	12	36
Infant feeding:				
Bottle fed	109	20	57	23
Nursed	439	80	187	77
Milk drinking:				
Little	110	13	48	10
Much	709	87	412	90
Past illnesses (having had acute respiratory infections—selected)	666	68	406	77

[1] Mean age, nearest birthday, 19.9. [2] Mean age, nearest birthday, 19.4.

TABLE 4.—*Examination and observed illness in same group as in Table 3*

Items of examination	Tonsil status			
	Tonsils in		Tonsils out	
	Number	Per cent	Number	Per cent
Mean height ... inches	67.7		68	
Mean weight ... pounds	140.9		140.1	
Posture:				
A	128	13	64	12
B	427	44	235	45
C	309	31	191	36
D	98	10	37	7
Observed illness (1 years' records)				
Acute respiratory infections (diagnoses)	442	45	335	63
Dispensary patients	717	73	423	77
Dispensary and room calls	1,017	104	672	125
Infirmary patients	73	7.4	32	6
Infirmary days		10.5		7.8

DISCUSSION

There seems to be little if any significant difference in these data relative to the health of students who came to the University of Michigan with or without having had the operation of tonsillectomy. The data given are for the findings at the entrance examination and during subsequent attention to health through the period of university residence. There is a suggestion of advantage to the tonsillectomized group in general appearance of nutrition and general health grade. The most significant differences seem to indicate that those students with their tonsils in have less trouble with acute upper respiratory infections, but they have more cervical adenopathy.

It must be assumed that the tonsillectomies were done on people who were having trouble and were particularly subject to illness. Such being the case, the operations must have enabled that group to overcome the handicap and enjoy health equal to other students. Case data relative to conditions before and after tonsillectomy in the same persons will probably give the best evaluation of the operation. The need for conservatism in tonsillectomy was recently voiced by Canfield.[1]

PUBLIC HEALTH ENGINEERING ABSTRACTS

Indianapolis Keeps Profit in Garbage. Eugene M. Reid. *The American City*, vol. 37, No. 6, December, 1927, pp. 753-757. (Abstract by J. B. Harrington.)

Under the supervision of E. W. McCullough, consulting engineer, and the board of commissioners, experiments were begun in 1922 to determine a satisfactory method of garbage reduction. The new plant constructed in Indianapolis at a cost of $460,000 contains modern equipment for extracting all salable products from the refuse

Details of the collection trailers, McCullough separators, digesting tanks, and screens are given. Tests have shown that 5.43 tons of green garbage produce 1 ton of crude tankage consisting of approximately 14 per cent of coarse rubbish, 34 per cent fine rubbish, and 52 per cent of feed tankage. Approximately 40 pounds of grease per 1 ton of garbage also are obtained. Grease is worth from 5 to 7 cents per pound and fertilizer filler about $4.50 per ton.

During the three months, June 1 to August 31, the net profit, deducting capital charges, amounted to $15,195.94.

Refuse: Its Storage, Collection, and Disposal. T. Douglas. *The Surveyor*, vol. 72, No. 1860, September 16, 1927, pp. 251-252. (Abstract by C. C. Ruchhoft.)

A variety of articles are used for the storage of refuse in England, but a uniformity in receptacles is desirable. A portable dust bin is recommended as the best possible means of storage for domestic refuse.

The cost of collection varies from $0.75 to $3.75 per ton, and there is room for improvement and reduction in cost. The tendency in England has been toward the replacement of horses by automobiles for collection. The absence of alleys and the long carrying distances down terraces and sometimes through dwellings increase time and cost of collection. It was found that two vehicles working in conjunction in districts supplied with portable dust bins have given the most economical service.

The disposal of refuse without offense to nose or eye is a difficult task and requires that the cleansing departments be equipped, organized, and controlled in an efficient manner. Due to the varying character of the refuse, various methods of disposal are employed, each claiming efficiency and economy. The efficiency of a method for a community can be estimated only after a study of the local conditions.

Odors from Rendering Offal. Robert D. MacLaurin. *American Journal of Public Health*, vol. 17, No. 10, October, 1927, p. 1026. (Abstract by H. N. Old.)

Brief description is given in this article of the two methods of fat recovery from offal—the wet method, which involves cooking the material with steam under pressure, and the dry method, which consists in cooking in a "melter," in which the protein material is cooked in its own fat.

[1] Annals of Clinical Medicine, vol IV, No. 12, June, 1926.

The dry method is gradually replacing the wet method; and from the point of view of odors it is simpler, cheaper to operate, and requires less care, the only odor control equipment required being a water condenser to condense the steam and volatile gases from the cooking operation.

It is stated that the principal consideration in control of odors from offal rendering is that of processing the material in a fresh condition, as putrefaction will be found the usual cause of excessive odor in rendering. The question of satisfactory odor control is essentially one of efficient plant management in the use of either the wet or dry system, and the conclusion is reached that the watchword for odorless rendering of offal is "prevention."

Oyster Storage. John E. Bacon. *Public Health News*, vol. 13, No. 1, December, 1927, pp. 16–23. (Abstract by Harriet S. Ryan.)

This is a report of the investigation made of the oyster industry at Maurice River, which furnishes employment for about 3,500 men. The prosperity of the industry was threatened by a ruling of the Federal Department of Agriculture which prohibited interstate shipment of oysters stored in waters of less salt content than that in which they were grown. Oysters taken from the south Jersey beds contain quantities of objectionable silt, which is removed by allowing the oysters to cleanse themselves in "storage floats." In order that these floats may be protected from storms and not be a menace to navigation, they are placed near the mouths of rivers or creeks, which, on account of the lower salinity of such waters, results in the incorporation of some additional waters in shellfish. This was a violation of the pure food and drug law, and the problem before the oystermen and the State department of health was to find an uncontaminated storage area sufficiently high in salinity to prevent the oyster from taking on "added water." An investigation was made of the area at the mouth of the Maurice River to determine the effect of storage upon oysters placed in these waters.

A concise account is given of the operations and the results of the investigation, together with illustrative pictures, a map showing location of the floats used in this study, and a table outlining the experiments.

The investigation showed that salt oysters from Delaware Bay can be stored for cleansing purposes in the waters of Greenbank Reach, Maurice River, and removed from the "float" during the first of ebb tide and not contain an excessive amount of "added water." The United States Department of Agriculture now acknowledges the necessity of storage for purposes of cleansing and improving oysters and approves the waters at the mouth of the Maurice River for this purpose, provided the shellfish are removed from the storage float during certain stages of the tide so as to result in the incorporation of the least added water. This period of the tide is between one hour before high water and three hours before ebb tide.

Use of Returned Sludge Speeds up Water Softening Reactions. Anon. *Engineering News-Record*, vol. 99, No. 19, November 10, 1927, p. 748. (Abstract by D. E. Kepner.)

According to A. W. Bull, in a paper presented before the Southwestern Water Works Association in October, 1927, laboratory tests at Columbus and Pittsburgh showed that the use of returned sludge hastened water softening reactions considerably.

At Columbus, 19 hours' agitation was required, without the use of returned sludge, to reduce the soap hardness of the water to 66 p. p. m., while the same reduction was accomplished in two hours with the use of 50 cubic centimeters of returned sludge per gallon, and in one hour with 100 cubic centimeters of sludge per gallon, employing 11 grains of lime and 11 grains of soda ash per gallon, and a temperature of 17° C., in each case. The final alkalinity and causticity of the water were not greater when using the sludge than when not using it. Best results were secured with a sludge concentration of 15,000 p. p. m. (about 60 cubic centimeters per gallon).

At Pittsburgh, with water unusually high in $MgSO_4$, a sludge concentration of 7,100 p. p. m. produced good results. The water was apparently softened as easily at 0° C. as at 10° C. with the sludge and in both cases better than could have been done at 30° C. without the sludge. A clearer effluent is also claimed to result from the use of returned sludge.

Emergency Ventilator in Chlorinating Room. Anon. *Engineering News-Record*, vol. 100, No. 1, January 5, 1928, p. 9. (Abstract by Harriet S. Ryan.) A temporary arrangement had to be devised for feeding chlorine gas into the city water at Albany, N. Y., until a new pipe line could be constructed. The apparatus is located in a room underneath the sidewalk adjoining the main pumping station. When leaks occur in the gas line, the pumping station attendant notifies the man in charge of the apparatus, who makes the repairs, closes the air-tight door of the chlorinating room, and starts, from a switch in the pumping station, the electrically driven blower, which draws air from near the floor of the chlorinating room and discharges it into the outside atmosphere.

Progress Report on Gas-Forming Organism in the Akron Water Supply. C. O. Hostettler. Sixth Annual Report of Ohio Conference on Water Purification, 1926, pp. 85–86. (Abstract by R. E. Thompson.) Additional data are given on gas-forming organism present in Akron supply which ferments lactose broth only after 24 hours' incubation and on effectiveness of lactose broth containing 0.5 per cent lactose peptone bile for its inhibition. Results show that modified broth does not inhibit *B. coli*, but does inhibit organisms giving rise to fermentation after 24 hours' incubation. Use of modified broth hastens obtaining of results and reduces volume of work.

Open Reservoirs for Filtered Water on the Distributing System. Clarence Bahlman. Sixth Annual Report of Ohio Conference on Water Purification, 1926, pp. 86–88. (Abstract by R. E. Thompson.) Explosive appearance of vigorous positive *B. coli* tests in tap samples in Cincinnati was traced to contamination of open filtered water reservoir by manure carried by wind from near-by shrubbery beds. The organisms were very resistant to chlorine, and dosages which had to be resorted to gave rise to many complaints of taste. It was more than two months after first appearance of contamination until a coli-free water was again obtained.

Colombian Water Supplies, if Not Pure, Have Many Uses. David and Muriel Yale. *Water Works Engineering*, vol. 80, No. 25, December 7, 1927, pp. 1740 and 1764. (Abstract by Frank Raab.) In Colombia, in the Andes Mountains, where the villages are built on the mountain sides, the inhabitants secure their water supplies from streams which are located on a higher elevation than the village. The streams are tapped and the water is brought to the village through ditches along which the dwellings are located. These ditches provide garbage disposal, sewage disposal, and, in a few instances, power for lighting. The socially elect build their houses at the higher elevations and thus get the water at its purest; while the peons, or poorer classes, who live at the lower ends of these ditches, take the water with all the pollution which it has gathered. A ditch also carries the water to a public fountain, which is usually located in the center of the village; the peon, however, usually does not bother to walk to the fountain for his drinking supply, but contents himself in taking it from the polluted ditch as it passes his dwelling. Women wash clothes, and children, dogs, pigs, cattle, and mules wade about in the stream before it reaches even the first dwellings. The inhabitants never think of blaming the water supply for sickness or death, which it no doubt causes in many cases.

Carbon Dioxide Treatment at St. Louis Water Works. A. V. Graf. *Engineering News-Record*, vol. 99, No. 16, October 20, 1927, p. 643. (Abstract by A. H. Wieters.)

St. Louis is planning a further refinement in the purification of water by the use of carbon dioxide. Each of the two filter plants will be equipped with carbon dioxide devices consisting of a gas-producing burner, combined washer, scrubber and drier, gas burner, and compressor, or blower.

Softening of the water is limited to partial removal of bicarbonate hardness and only occasionally enough lime is used to render the water caustic. The normal carbonate alkalinity of the settled water varies from 22 to 67 p. p. m., and that of water applied to filters from 2 to 30 p. p. m. This reduction is due to the use of aluminum sulphate as a coagulant. The coating on the filter sand now amounts to 17 per cent of the filtering material, and there have been complaints of clogging of water heaters.

The author states that the use of carbon dioxide is not of as recent origin as most water works men believe. He points out that it was used at Derby, England, in 1892.

Softening Plant with Unusual Features. J. F. Laboon. *Water Works Engineering*, vol. 80, No. 25, December 7, 1927, pp. 1731-1732 and 1748–1751. (Abstract by Frank Raab.)

Fostoria, with a population of about 12,000, has an average daily water consumption of 1,400,000 gallons. It is proposed to soften the water by the lime-soda method. The new plant will have a settling basin equipped with a thickener and having a retention period of 2 hours at a 3,000,000-gallon rate, 4 filters each with a 750,000-gallon daily capacity. The filter gravel bed is 18 inches and the sand bed is 30 inches deep; the mixing tank, which also has a stirring equipment to prevent bottom deposits, has a retention period of 30 minutes at a 3,000,000-gallon rate; the clear wells and the clear water basin have a capacity of 645,000 gallons. A centrifugal sump pump to remove drainage and also to remove sludge from the clarifier, is provided. The wash water tank holds 50,000 gallons. There is a carbonating chamber with scrubbers, driers, and compressors, aerating equipment, office, laboratory, and toilet rooms. A belt conveyor carries the sacks of chemicals to the dry-feed machines. The plant has a sand washer, a central operating table with controls of the Venturi meter, the clear wells and wash water basin and also a telemeter gauge of the stand-pipe tower. Each filter has its operating table with loss of head and rate of flow gauges and hydraulically operated valves. The influent wall is perforated to give perfect distribution. The effluent wall is equipped with adjustable baffle weirs. The chlorine room is equipped with two chlorinators and scales. Two points of chlorine application are provided. The estimated cost of the total improvements is $178,529.

The Proper Methods Respecting Chlorination of Water Supplies. J. Van Benschoten. *Public Health Journal* (Canadian Public Health Association), vol. 18, No. 11, November, 1927, pp. 537-542. (Abstract by H. D. Cashmore.)

A brief history up to the present time of the development of chlorination of water and some figures on the reduction of the typhoid death rate in this country are given. The cycle of a water supply is touched on lightly as well as the relation of water to man and certain diseases. There is included a short discussion of the basic types of chlorinators, dry feed and solution feed, including the the vacuum type, in regard to their application to different conditions of climate and water supply. Points to be considered in the selection of a machine, with stress laid on the importance of including all details of construction and equipment of the system, are given with a view of aiding this important step. In addition to the discussion in regard to a water supply, there are also included a few brief statements relative to the use of chlorine in sewage disposal operations.

DEATHS DURING WEEK ENDED FEBRUARY 25, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended February 25, 1928, and corresponding week of 1927. (From the Weekly Health Index, March 1, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Feb. 25, 1928	Corresponding week 1927
Policies in force	70, 067, 743	66, 849, 234
Number of death claims	13, 321	11, 837
Death claims per 1,000 policies in force, annual rate	9. 9	9. 2

Deaths from all causes in certain large cities of the United States during the week ended February 25, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, March 1, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Feb. 25, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 25, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb. 25, 1928	Corresponding week 1927	
Total (66 cities)	8, 133	14. 2	13. 9	857	913	[3] 71
Akron	52			7	4	76
Albany [4]	41	17. 8	18. 8	7	7	143
Atlanta	86	17. 7	15. 7	10	10	
White	43		11. 6	7	3	
Colored	43	(5)	25. 4	3	7	
Baltimore [4]	248	15. 6	16. 0	18	27	57
White	177		13. 9	10	16	40
Colored	71	(5)	28. 1	8	11	125
Birmingham	73	17. 2	14. 1	8	9	68
White	37		7. 1	4	2	55
Colored	36	(5)	25. 2	4	7	90
Boston	265	17. 3	16. 1	[illegible]	26	89
Bridgeport	46			13	2	238
Buffalo	160	15. 1	13. 7	17	23	73
Cambridge	35	14. 5	14. 7	7	4	125
Camden	83	12. 7	16. 5	5	5	80
Canton	28	12. 5	7. 4	2	1	48
Chicago [4]	795	13. 2	12. 9	75	95	64
Cincinnati	149	18. 8	18. 3	13	10	79
Cleveland	182	9. 4	12. 1	13	27	35
Columbus	72	12. 7	16. 8	7	9	65
Dallas	50	12. 0	12. 6	10	5	
White	33		10. 2	7	4	
Colored	17	(5)	28. 5	3	1	
Denver	100	17. 8	18. 4	15	12	
Des Moines	30	10. 3	8. 8	1	5	17
Detroit	331	12. 6	13. 2	57	68	88
Duluth	20	9. 0	9. 5	3	0	70
El Paso	46	20. 4	11. 5	8	5	
Erie	27			2	3	41
Fall River [4]	25	9. 7	17. 3	5	8	86
Flint	23	8. 1	9. 9	4	4	51
Fort Worth	34	10. 6	12. 7	6	7	
White	24		11. 6	5	7	
Colored	10	(5)	21. 3	1	0	
Grand Rapids	32	10. 2	9. 3	5	2	75
Houston	65			7	8	
White	47			5	6	
Colored	18	(5)		2	2	
Indianapolis	112	15. 3	14. 9	4	12	30
White	94		14. 7	4	11	35
Colored	18	(5)	16. 3	0	1	0
Jersey City	76	12. 2	12. 3	10	8	75

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 59 cities.
[4] Deaths for week ended Friday Feb. 24, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended February 25, 1928, etc.—Continued

City	Week ended Feb. 25, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 25, 1928
	Total deaths	Death rate		Week ended Feb. 25, 1928	Corresponding week 1927	
Kansas City, Kans.	33	14.6	13.3	1	6	21
White	19		13.0	0	5	0
Colored	14	([5])	14.8	1	1	145
Kansas City, Mo.	114	15.2	16.3	6	8	42
Knoxville	32	15.9	17.9	5	2	109
White	28		15.1	5	1	121
Colored	4	([5])	38.5	0	1	0
Los Angeles	284			18	14	51
Lowell	28	13.3	10.4	4	4	84
Lynn	24	11.9	13.4	5	4	126
Memphis	86	23.6	21.6	6	7	70
White	43		19.0	3	2	56
Colored	43	([5])	26.3	3	5	94
Milwaukee	100	9.6	10.8	17	19	76
Minneapolis	106	12.2	11.5	9	10	54
Nashville	58	21.9	15.5	6	5	94
White	41		14.2	3	3	64
Colored	17	([5])	18.8	3	2	180
New Bedford	29	12.7	14.4	4	7	87
New Haven	53	14.7	13.0	4	2	56
New Orleans	160	20.6	19.3	17	18	82
White	114		16.6	9	4	65
Colored	55	([5])	20.9	8	14	116
New York	1,705	14.8	13.7	201	176	81
Bronx Borough	229	12.6	10.5	27	14	82
Brooklyn Borough	572	13.0	12.4	76	73	76
Manhattan Borough	730	21.8	18.5	76	71	90
Queens Borough	133	8.1	9.6	18	15	72
Richmond Borough	41	14.2	16.4	4	3	72
Newark, N. J.	140	15.5	11.2	22	9	113
Oklahoma City	39			2	6	
Omaha	55	12.9	13.8	2	5	23
Paterson	32	11.5	10.5	2	4	35
Philadelphia	577	14.6	13.8	50	58	67
Pittsburgh	188	14.6	16.6	22	25	72
Portland, Oreg.	80			1	6	11
Providence	57	10.4	10.2	11	5	96
Richmond	61	16.4	12.8	9	5	118
White	33		7.3	4	1	81
Colored	28	([5])	26.3	5	4	184
Rochester	78	12.4	12.9	8	7	65
St. Louis	273	16.8	12.9	21	13	70
St. Paul	55	11.4	13.3	4	2	38
Salt Lake City [4]	38	14.4	13.8	5	6	82
San Antonio	86	20.6	17.3	7	12	
San Diego	40	17.5	23.1	1	1	19
San Francisco	155	13.8	13.4	15	12	94
Schenectady	25	14.0	10.8	4	5	125
Seattle	78	10.6	11.1	1	3	10
Somerville	26	13.2	10.8	2	4	60
Spokane	30	14.4	18.2	4	5	103
Springfield, Mass.	31	10.8	11.3	2	5	32
Syracuse	57	15.0	10.9	4	5	49
Toledo	80	13.4	13.7	7	7	67
Trenton	45	16.9	18.7	3	3	51
Utica	42	21.1	21.2	3	4	68
Washington, D. C.	150	14.2	18.1	12	19	68
White	97		12.9	8	5	66
Colored	53	([5])	33.3	4	14	74
Waterbury	19			2	2	58
Wilmington, Del.	21	8.5	12.8	1	5	26
Worcester	60	15.9	16.3	2	9	24
Yonkers	37	15.9	12.3	3	5	68
Youngstown	33	9.9	10.2	3	10	40

[4] Deaths for week ended Friday Feb. 24, 1928.

[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended March 5, 1927, and March 3, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 5, 1927, and March 3, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928
New England States:								
Maine	3	6	8		158	35	0	0
New Hampshire		4		11		33		0
Vermont	4				37	21	0	0
Massachusetts	87	100	23	9	271	1,993	1	1
Rhode Island	10	9		1	3	29	0	0
Connecticut	29	20	7	3	146	358	1	1
Middle Atlantic States:								
New York	392	388	[1] 150	[1] 40	858	2,108	5	15
New Jersey	123	122	36	16	54	774	0	1
Pennsylvania	187	310			1,014	1,864	1	9
East North Central States:								
Ohio		95		41		495		0
Indiana	40	25	27	31	215	190	0	0
Illinois	109	151	44	60	2,420	151	4	7
Michigan	85	77		8	266	1,135	0	6
Wisconsin	50	26	46	57	620	89	2	6
West North Central States:								
Minnesota	40	13	1	5	283	13	6	0
Iowa [2]	20	10			498	16	1	1
Missouri	40	54		47	193	184	0	3
North Dakota	8	8			194	7	0	0
South Dakota	4		17	3	477	39	1	0
Nebraska	6	17	27	17	215	8	0	2
Kansas	24	17	7	46	737	42	0	0
South Atlantic States:								
Delaware	4	2		2	10	8	0	0
Maryland [2]	60	44	356	51	38	1,012	0	0
District of Columbia	36	21	21		4	113	0	0
Virginia								
West Virginia	23	12	86	34	174	87	0	0
North Carolina [3]	30	29			160	3,692	0	1
South Carolina	11	19	979	1,028	121	1,237	0	0
Georgia	12	13	222	211	102	321	1	2
Florida	23	26	10	4	147	11	0	1
East South Central States:								
Kentucky		2				241		0
Tennessee	14	8	47	136	221	201	1	2
Alabama	62	34	82	247	244	292	0	0
Mississippi	4	12						2
West South Central States:								
Arkansas	2	13	51	609	20	626	0	1
Louisiana	18	20	17	77	106	247	0	0
Oklahoma [4]	36	25	188	235	357	257	5	2
Texas	40	36	71	196	146	671	1	2

[1] New York City only.
[2] Week ended Friday
[3] For week ended February 18, 1928, North Carolina reported 4,257 cases of measles, which should have been included in the table on page 466 of Public Health Reports for Feb. 24, 1928.
[4] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 5, 1927, and March 3, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928
Mountain States:								
Montana	13	13			66	8	6	4
Idaho	1	1			62		0	3
Wyoming	3		1		44	10	0	1
Colorado	8	10		24	352	30	3	12
New Mexico	4	4	2	5	48	168	0	0
Arizona	7	5	1	2	77	4	0	1
Utah [2]	11	6	8	3	209	1	0	1
Pacific States.								
Washington	9	8	8	1	198	363	3	5
Oregon	10	17	270	33	85	98	3	2
California	130	121	101	57	3,748	265	1	6

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928	Week ended Mar. 5, 1927	Week ended Mar. 3, 1928
New England States:								
Maine	0	0	25	26	0	0	3	2
New Hampshire		1		22		0		0
Vermont	0	0	10	2	0	0	3	0
Massachusetts	2	6	457	332	0	0	9	2
Rhode Island	0	0	23	36	0	0	0	0
Connecticut	0	1	96	74	0	3	1	0
Middle Atlantic States:								
New York	1	4	1,203	831	10	13	16	26
New Jersey	0	0	396	282	0	0	3	1
Pennsylvania	0	2	650	785	0	0	20	14
East North Central States:								
Ohio		1		423		33		4
Indiana	0	0	242	180	171	126	6	1
Illinois	1	1	370	393	34	40	6	8
Michigan	0	0	364	326	25	22	10	6
Wisconsin	1	0	225	204	4	33	5	0
West North Central States:								
Minnesota	0	0	282	173	1	4	4	1
Iowa [2]	0	0	71	105	5	63	1	1
Missouri	2	0	148	109	16	85	2	2
North Dakota	0	1	106	52	2	1	0	5
South Dakota	1	0	153	28	6	0	2	1
Nebraska	0	1	49	134	55	64	2	1
Kansas	0	0	168	188	43	49	2	0
South Atlantic States:								
Delaware	0	0	41	2	0	0	0	0
Maryland [2]	0	2	82	74	0	0	4	4
District of Columbia	0	0	20	45	1	0	3	0
Virginia		1				0		
West Virginia	0	1	53	51	39	9	28	0
North Carolina	0	1	21	33	48	119	12	2
South Carolina	0	2	8	9	15	7	4	3
Georgia	0	0	22	15	87	0	2	4
Florida	0	0	10	11	50	12	13	15
East South Central States:								
Kentucky		0		51		11		2
Tennessee	0	0	46	38	24	34	14	4
Alabama	1	0	22	18	40	26	25	14
Mississippi	0	2	11	24	12	10	6	4
West South Central States:								
Arkansas	0	0	12	19	1	8	3	2
Louisiana	0	2	4	8	3	22	4	7
Oklahoma [3]	1	1	55	60	59	94	14	3
Texas	0	0	57	80	128	92	1	4
Mountain States:								
Montana	0	0	144	23	24	18	1	0
Idaho	0	1	21	5	0	4	0	1
Wyoming	0	0	45	6	0	5	1	0
Colorado	0	0	54	158	8	20	2	2
New Mexico	0	0	17	85	7	1	1	0
Arizona	0	0	10	4	0	67	3	0
Utah [2]	0	0	12	4	1	13	0	1
Pacific States:								
Washington	0	4	116	49	43	46	4	0
Oregon	0	3	73	36	25	58	2	0
California	1	8	238	182	12	32	5	7

[2] Week ended Friday.

[3] Exclusive of Tulsa.

Reports for Week Ended February 25, 1928

DISTRICT OF COLUMBIA

	Cases
Diphtheria	38
Influenza	2
Measles	54
Scarlet fever	49
Typhoid fever	1

NEW HAMPSHIRE

	Cases
Diphtheria	1
Influenza	12
Measles	39
Scarlet fever	23

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Cerebrospinal meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November, 1927										
Colorado	8	129			44		13	308	51	32
December, 1927										
Colorado	8	79	2		68		6	285	30	11
January, 1928										
Alabama	7	163	1,039	54	806	13	1	73	24	43
Arkansas	3	63	866	103	1,097	76	2	129	65	30
Dist. of Columbia	2	140	11		38		0	153	0	2
Idaho	8	2	1		10		0	126	80	3
Illinois	41	761	156	8	234		9	1,515	121	57
Mississippi	2	101	9,065	2,069	5,174	355	2	143	132	50
Missouri	11	197	47		252		6	401	215	15
Montana	17	25	11		6		1	141	135	3
North Carolina	1	270			13,760		1	382	501	9
Ohio	8	705	131		2,163		14	1,452	98	54
Oklahoma [1]	5	155	878	44	464	6	3	160	512	38
Oregon	4	48	131		168		22	88	193	13
Pennsylvania	11	1,123			3,963	2	7	2,348	0	80
Rhode Island	0	95	22		37		0	214	0	5
Tennessee	5	91	685	17	2,994	14	4	95	98	37
Washington	12	70	3		247		14	299	228	13
Wyoming	21	5			19		0	136	30	1

[1] Exclusive of Oklahoma City and Tulsa.

November, 1927

	Cases
Colorado:	
Chicken pox	450
German measles	8
Impetigo contagiosa	7
Mumps	59
Ophthalmia neonatorum	1
Whooping cough	76

December, 1927

	Cases
Colorado:	
Chicken pox	352
German measles	5
Impetigo contagiosa	4
Mumps	69
Paratyphoid fever	1
Puerperal septicemia	1
Whooping cough	53

January, 1928

	Cases
Actinomycosis:	
Illinois	1

[1] Exclusive of Oklahoma City and Tulsa.

January, 1928—Continued

	Cases
Anthrax:	
Pennsylvania	1
Chicken pox:	
Alabama	180
Arkansas	291
District of Columbia	137
Idaho	109
Illinois	1,753
Mississippi	802
Missouri	279
Montana	76
North Carolina	775
Ohio	1,746
Oklahoma [1]	141
Oregon	298
Pennsylvania	3,339
Rhode Island	48
Tennessee	208
Washington	374
Wyoming	63

January, 1928—Continued

	Cases
Dengue:	
Alabama	2
Mississippi	18
Conjunctivitis:	
Idaho	4
Montana	1
Dysentery:	
Illinois	20
Mississippi—	
Amebic	43
Bacillary	378
Oklahoma [1]	14
Tennessee	3
German measles:	
Illinois	22
Montana	3
North Carolina	22
Ohio	50
Pennsylvania	78
Rhode Island	1
Washington	36
Hookworm disease:	
Arkansas	5
Mississippi	232
Impetigo contagiosa:	
Oregon	11
Washington	4
Lead poisoning:	
Illinois	10
Ohio	16
Lethargic encephalitis:	
Alabama	2
Illinois	3
Montana	1
Ohio	6
Pennsylvania	10
Mumps:	
Alabama	156
Arkansas	219
Idaho	103
Illinois	1,171
Mississippi	1,100
Missouri	635
Montana	3
Ohio	1,375
Oklahoma [1]	73
Oregon	80
Pennsylvania	2,932
Rhode Island	60
Tennessee	114
Washington	326
Wyoming	9
Ophthalmia neonatorum:	
Arkansas	3
Idaho	1
Illinois	38
Mississippi	9
North Carolina	1
Ohio	109
Oklahoma [1]	1
Rhode Island	1
Washington	4

[1] Exclusive of Oklahoma City and Tulsa.

January, 1928—Continued

	Cases
Paratyphoid fever:	
Ohio	4
Rhode Island	1
Tennessee	1
Washington	4
Puerperal fever:	
Illinois	4
Mississippi	35
Ohio	6
Pennsylvania	8
Tennessee	2
Rabies in animals:	
Idaho	2
Mississippi	6
Missouri	5
Oregon	2
Rhode Island	2
Washington	2
Rabies in man:	
Ohio	1
Pennsylvania	1
Tennessee	1
Scabies:	
Oregon	12
Washington	1
Septic sore throat:	
Idaho	2
Illinois	10
Missouri	27
North Carolina	9
Ohio	69
Oklahoma [1]	20
Oregon	12
Tetanus:	
Missouri	2
Oklahoma [1]	1
Pennsylvania	2
Tennessee	2
Trachoma:	
Arkansas	100
Illinois	6
Mississippi	36
Ohio	7
Oklahoma [1]	16
Tennessee	6
Tularaemia:	
Alabama	1
Illinois	2
Montana	1
Tennessee	11
Typhus fever:	
Alabama	1
Undulent fever:	
Pennsylvania	1
Vincent's angina:	
Oklahoma [1]	1
Whooping cough:	
Alabama	97
Arkansas	80
District of Columbia	43
Idaho	6
Illinois	1,101

January, 1928—Continued

Whooping cough—Continued.	Cases
Mississippi	1,401
Missouri	208
Montana	31
North Carolina	544
Ohio	702
Oklahoma [1]	22

January, 1928—Continued

Whooping cough—Continued.	Cases
Oregon	20
Pennsylvania	1,144
Rhode Island	19
Tennessee	135
Washington	41
Wyoming	76

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 99 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,100,000. The estimated population of the 93 cities reporting deaths is more than 30,450,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended February 18, 1928, and February 19, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
41 States	1,945	2,088	
99 cities	1,052	1,203	1,000
Measles:			
40 States	16,119	14,081	
99 cities	5,394	4,721	
Poliomyelitis:			
41 States	30	16	
Scarlet fever:			
41 States	4,710	6,348	
99 cities	1,725	2,561	1,456
Smallpox:			
41 States	1,163	920	
99 cities	121	184	125
Typhoid fever:			
41 States	175	256	
99 cities	29	53	46
Deaths reported			
Influenza and pneumonia:			
93 cities	1,140	971	
Smallpox:			
93 cities	1	0	
Houston, Tex	1	0	

[1] Exclusive of Oklahoma City and Tulsa.

City reports for week ended February 18, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics, It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1928, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	6	2	5	0	0	3	7	2
New Hampshire:									
Concord	[1] 22,546	0	0	1	0	0	0	0	0
Manchester	84,000	0	3	0	0	0	0	0	1
Vermont									
Barre	[1] 10,008	2	0	0	0	0	0	0	0
Massachusetts.									
Boston	787,000	67	50	27	9	1	528	8	34
Fall River	131,000	4	4	2	4	2	0	0	9
Springfield	145,000	5	3	8	0	0	3	57	1
Worcester	193,000	11	5	2	0	0	9	91	5
Rhode Island									
Pawtucket	71,000	4	1	1	0	0	1	21	3
Providence	275,000	2	10	6	0	0	20	6	5
Connecticut.									
Bridgeport	([2])	4	8	13	2	1	0	0	2
Hartford	164,000	9	8	9	1	0	3	4	7
New Haven	182,000	10	2	1	0	1	154	26	6
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	16	14	16	5	1	556	54	19
New York	5,924,000	204	213	313	36	21	352	16	251
Rochester	321,000	13	10	14	1	0	3	8	5
Syracuse	185,000	29	4	1		0	93	3	3
New Jersey:									
Camden	131,000	4	5	4	1	1	5	5	6
Newark	459,000	49	15	30	3	0	211	31	10
Trenton	134,000	2	3	3	0	0	8	0	3
Pennsylvania:									
Philadelphia	2,008,000	99	78	66		7	144	115	77
Pittsburgh	637,000	24	21	32		7	62	96	27
Reading	114,000	7	3	1		0	2	2	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	20	10	10	0	2	313	8	9
Cleveland	960,000	44	32	55	2	1	31	232	21
Columbus	285,000	4	4	2	3	3	13	13	2
Toledo	295,000	28	7	2	1	1	294	19	9
Indiana:									
Fort Wayne	99,900	1	3	2	0	0	0	0	0
Indianapolis	367,000	22	8	16	0	0	24	103	12
South Bend	81,700	1	1	1	0	0	0	0	3
Terre Haute	71,900	1	1	0	0	1	0	0	3
Illinois:									
Chicago	3,048,000	133	89	116	14	7	25	55	101
Springfield	64,700	11	1	1	0	0	0	21	1
Michigan:									
Detroit	1,290,000	47	62	43	2	1	391	53	34
Flint	136,000	10	5	0	0	0	1	221	8
Grand Rapids	150,000	0	3	0	0	1	8	15	0

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended February 18, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha	52,700	28	2	0	0	0	2	6	1
Madison	47,600	6	0	0	0	0	0	4	2
Milwaukee	517,000	64	18	12	2	2	2	21	13
Racine	69,400	6	2	1	0	0	1	5	0
Superior	[1] 39,671	1	0	0	0	0	0	0	2
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	-------	1	-------	-------	-------	-------	-------	-------
Minneapolis	434,000	62	17	10	0	1	4	8	3
St. Paul	248,000	15	14	5	0	0	0	76	13
Iowa:									
Davenport	[1] 52,469	3	1	0	0	-------	0	0	-------
Des Moines	146,000	0	3	0	0	-------	0	0	-------
Sioux City	78,000	4	2	0	0	-------	8	14	-------
Waterloo	36,900	0	0	1	0	-------	1	8	-------
Missouri:									
Kansas City	375,000	-------	7	-------	-------	-------	-------	-------	-------
St. Joseph	78,400	1	2	0	0	0	0	6	4
St. Louis	830,000	22	47	34	1	0	102	20	-------
North Dakota:									
Fargo	[1] 26,403	10	0	0	0	1	0	6	2
Grand Forks	[1] 14,811	0	0	0	0	-------	1	0	-------
South Dakota:									
Aberdeen	[1] 15,036	1	0	0	0	-------	0	0	-------
Sioux Falls	[1] 30,127	0	0	0	0	-------	0	0	-------
Nebraska:									
Lincoln	62,000	2	1	1	0	0	0	35	0
Omaha	216,000	6	4	3	0	0	1	9	6
Kansas:									
Topeka	56,500	17	1	3	0	0	0	6	0
Wichita	92,500	38	4	2	0	0	2	1	0
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	4		1	0	0	0	5	4
Maryland:									
Baltimore	808,000	106	31	25	26	6	591	17	42
Cumberland	[1] 33,741	1	0	0	2	0	1	1	1
Frederick	[1] 12,035	0	1	0	0	0	0	0	0
District of Columbia:									
Washington	528,000	18	20	33	4	5	61	0	11
Virginia:									
Lynchburg	30,500	0	1	2	0	0	6	0	4
Norfolk	174,000	21	2	4	0	0	54	2	8
Richmond	189,000	3	4	9	0	1	121	3	4
Roanoke	61,900	3	1	2	0	1	1	1	1
West Virginia:									
Charleston	50,700	1	1	0	0	0	0	0	3
Wheeling	[1] 56,208	0	1	0	0	0	0	0	3
North Carolina:									
Raleigh	[1] 30,371	5	1	1	0	0	57	0	0
Wilmington	37,700	0	0	0	0	2	18	0	1
Winston-Salem	71,800	5	1	1	0	0	153	27	4
South Carolina:									
Charleston	74,100	9	0	0	99	1	6	0	7
Columbia	41,800	7	1	1	0	1	106	37	11
Greenville	[1] 27,311	0	1	0	0	0	38	9	2
Georgia:									
Atlanta	(2)	9	3	3	45	2	4	0	10
Brunswick	[1] 16,809	0	1	0	0	0	37	4	2
Savannah	94,900	1	0	1	7	0	27	0	4
Florida:									
Miami	[1] 69,754	20	2	4	2	0	0	1	1
St. Petersburg	[1] 26,847	-------	0	-------	-------	0	-------	-------	0
Tampa	102,000	7	2	2	0	1	0	2	1

[1] Estimated, July 1, 1925.

City reports for week ended February 18, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	1	1	0	0	0	16	0	6
Lexington	47,500	2		0	0	0	5	5	2
Louisville	311,000	9	6	2	5	0	50	9	14
Tennessee:									
Memphis	177,000	16	3	2	0	2	167	26	7
Nashville	137,000	2	1	2	0	1	2	2	2
Alabama:									
Birmingham	211,000	5	3	3	9	4	33	8	8
Mobile	66,800	3	1	0	2	0	1	0	2
Montgomery	47,000	6	1	2	2		1	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	0	0	1	0		1	0	
Little Rock	75,900	2	0	1	2	0	251	0	4
Louisiana:									
New Orleans	419,000	2	12	11	12	9	2	0	19
Shreveport	59,500	3	1	0	0	0	142	0	2
Oklahoma:									
Oklahoma City	([2])	2	1	3	21	0	33	0	5
Tulsa	133,000	29	1	1	0		0	33	
Texas:									
Dallas	203,000		6	6	2	2	2		13
Fort Worth	159,000	22	2	0	0	1	3	6	5
Galveston	49,100	0	1	1	0	0	3	0	3
Houston	[1] 164,954	1	4	6	3	3	7	0	6
San Antonio	205,000	2	2	5	5	8	67	1	21
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	0
Great Falls	[1] 29,883	7	1	0	0	1	0	0	3
Helena	[1] 12,037	0	0	12	0	0	0	0	1
Missoula	[1] 12,668	2	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	1	0	0	0	0	0	4	0
Colorado:									
Denver	285,000	62	12	2		7	9	64	12
Pueblo	43,900	2	2	6	0	0	1	0	2
New Mexico:									
Albuquerque	[1] 21,000	3	0	0	0	0	82	0	0
Utah:									
Salt Lake City	133,000	15	3	1	0	0	1	4	1
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	([2])	30	7	7	0		178	13	
Spokane	109,000	1	3	0	0		0	3	
Tacoma	106,000	5	2	0	0	0	18	27	1
Oregon:									
Portland	[1] 282,383	25	8	1	3	0	13	4	5
California:									
Los Angeles	([2])	60	40	12	27	5	19	36	44
Sacramento	73,400	11	2	1	0	0	17	1	2
San Francisco	567,000	80	21	12	5	3	39	65	4

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended February 18, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	6	0	0	0	1	0	0	0	7	17
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	9
Manchester	3	3	0	0	0	3	1	0	0	0	25
Vermont:											
Barre	0	1	0	0	0	0	0	0	0	1	2
Massachusetts:											
Boston	80	80	0	0	0	10	1	1	0	73	248
Fall River	3	15	0	0	0	1	1	0	0	2	42
Springfield	8	21	0	0	0	0	0	0	0	5	34
Worcester	10	5	0	0	0	2	0	0	0	15	53
Rhode Island:											
Pawtucket	1	3	0	0	0	0	0	0	0	0	15
Providence	10	42	0	0	0	1	0	0	1	6	69
Connecticut:											
Bridgeport	14	12	0	0	0	3	0	0	0	0	14
Hartford	6	7	0	0	0	1	0	0	0	9	31
New Haven	11	0	0	0	0	2	0	1	0	10	-------
MIDDLE ATLANTIC											
New York:											
Buffalo	25	36	0	0	0	10	1	1	0	37	154
New York	285	411	0	0	0	100	7	4	3	183	1,652
Rochester	13	6	0	0	0	4	0	0	0	3	86
Syracuse	15	29	0	0	0	2	1	0	0	23	38
New Jersey:											
Camden	7	4	0	0	0	3	1	0	0	1	27
Newark	29	49	0	0	0	12	1	0	0	45	126
Trenton	5	1	0	0	0	1	0	1	0	1	31
Pennsylvania:											
Philadelphia	97	93	0	0	0	38	2	1	0	70	607
Pittsburgh	39	26	0	0	0	13	1	0	0	17	192
Reading	3	23	0	0	0	0	0	0	0	5	15
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	19	25	1	0	0	13	0	0	0	9	149
Cleveland	49	42	1	0	0	19	1	1	0	50	201
Columbus	11	17	1	1	0	3	0	0	0	2	83
Toledo	14	11	1	0	0	8	1	0	0	25	72
Indiana:											
Fort Wayne	6	6	0	0	0	0	0	1	0	1	26
Indianapolis	10	13	12	6	0	7	0	0	0	4	95
South Bend	3	1	0	0	0	0	0	1	0	3	-------
Terre Haute	3	2	0	2	0	0	0	0	0	0	21
Illinois:											
Chicago	145	129	2	4	0	43	3	2	1	146	801
Springfield	2	18	0	0	0	0	1	0	0	2	18
Michigan:											
Detroit	100	103	2	0	0	23	1	0	0	75	285
Flint	9	16	1	1	0	4	1	0	0	12	37
Grand Rapids	12	4	1	0	0	4	0	0	0	8	33
Wisconsin:											
Kenosha	2	7	0	4	0	0	0	0	0	2	5
Madison	5	2	0	0	0	0	0	0	0	0	[illegible]
Milwaukee	26	33	2	1	0	5	1	0	0	21	104
Racine	5	10	0	0	0	1	0	0	0	8	13
Superior	4	2	1	0	0	0	0	0	0	0	7
WEST NORTH CENTRAL											
Minnesota:											
Duluth	8	-------	0	-------	-------	-------	0	-------	-------	-------	-------
Minneapolis	59	23	5	3	0	4	0	1	0	2	75
St. Paul	36	12	6	0	0	1	1	0	0	10	82
Iowa:											
Davenport	2	5	2	3	-------	-------	0	0	-------	0	-------
Des Moines	5	20	1	10	-------	-------	0	0	-------	0	32
Sioux City	1	2	1	0	-------	-------	0	0	-------	0	-------
Waterloo	2	5	1	0	-------	-------	0	0	-------	0	-------

City reports for week ended February 18, 1928—**Continued**

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL—continued											
Missouri:											
Kansas City	13	-------	3	-------	-------	-------	0	-------	-------	-------	-------
St. Joseph	3	3	0	9	0	2	0	0	0	1	32
St. Louis	45	39	4	2	0	13	1	1	0	13	219
North Dakota:											
Fargo	2	2	1	0	0	1	0	0	0	3	11
Grand Forks	1	2	0	0	-------	-------	0	0	-------	0	-------
South Dakota:											
Aberdeen	1	3	0	0	-------	-------	0	0	-------	1	-------
Sioux Falls	3	4	1	0	-------	-------	0	0	-------	0	3
Nebraska:											
Lincoln	3	1	0	4	0	0	0	0	0	14	12
Omaha	6	12	10	5	0	4	0	0	0	1	47
Kansas:											
Topeka	2	1	1	6	0	0	0	0	0	14	8
Wichita	4	2	1	26	0	3	1	0	0	0	38
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	2	0	0	0	2	0	0	1	1	25
Maryland:											
Baltimore	46	25	0	0	0	14	2	0	1	44	280
Cumberland	1	1	0	0	0	0	0	0	0	0	9
Frederick	0	0	0	0	0	0	0	0	0	0	2
Dist. of Columbia:											
Washington	26	54	2	0	0	11	1	0	0	8	140
Virginia:											
Lynchburg	0	0	0	0	0	2	0	0	0	17	13
Norfolk	2	14	0	0	0	1	0	0	0	1	-------
Richmond	3	4	0	0	0	0	0	0	0	0	41
Roanoke	0	4	0	0	0	1	0	0	0	0	16
West Virginia:											
Charleston	1	5	1	7	0	0	0	0	0	0	13
Wheeling	1	4	0	0	0	0	0	0	0	0	23
North Carolina:											
Raleigh	0	0	1	0	0	0	0	0	0	2	13
Wilmington	1	0	0	0	0	1	1	0	0	0	9
Winston-Salem	0	1	4	0	0	0	0	0	0	0	20
South Carolina:											
Charleston	0	1	0	0	0	0	0	0	0	0	22
Columbia	0	1	0	0	0	3	0	0	0	2	40
Greenville	0	0	1	1	0	0	0	0	0	1	7
Georgia:											
Atlanta	4	10	7	1	0	3	0	0	0	0	66
Brunswick	0	0	0	0	0	0	0	0	0	0	9
Savannah	1	1	0	6	0	0	0	0	0	0	30
Florida:											
Miami	1	5	-------	0	0	1	0	0	0	1	31
St. Petersburg	0	-------	0	-------	0	1	0	-------	0	-------	10
Tampa	0	3	1	0	0	2	1	4	0	3	37
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	2	0	3	0	1	1	0	0	0	33
Lexington	-------	2	-------	0	0	2	-------	0	0	1	18
Louisville	6	24	1	0	0	5	1	1	0	5	98
Tennessee:											
Memphis	5	10	2	1	0	2	0	0	0	1	76
Nashville	5	0	1	0	0	4	0	1	1	0	58
Alabama:											
Birmingham	2	0	6	1	0	5	1	0	0	0	67
Mobile	0	2	0	0	0	0	0	1	0	0	15
Montgomery	1	0	0	0	-------	-------	1	0	-------	1	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	1	1	1	-------	-------	0	1	-------	1	-------
Little Rock	2	5	0	0	0	1	1	1	0	0	-------
Louisiana:											
New Orleans	7	4	1	0	0	20	2	1	0	2	198
Shreveport	0	3	1	0	0	1	0	0	0	3	31

City reports for week ended February 18, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL—continued											
Oklahoma:											
Oklahoma City	3	0	3	12	0	1	0	0	0	0	35
Tulsa	2	9	1	5			0	0		5	
Texas:											
Dallas	2	9	3	2	0	5	0	0	0		67
Fort Worth	1	8	3	3	0	0	0	0	0	0	42
Galveston	0	1	1	0	0	1	1	0	0	0	14
Houston	2	4	3	2	1	8	0	0	0	0	75
San Antonio	1	2	0	0	0	1	0	0	0	0	79
MOUNTAIN											
Montana:											
Billings	2	0	1	4	0	0	0	0	0	0	5
Great Falls	3	3	0	4	0	0	0	0	0	0	20
Helena	1	4	0	1	0	1	0	0	0	0	8
Missoula	0	0	0	0	0	0	0	0	0	0	4
Idaho:											
Boise	1	0	1	0	0	0	0	0	0	0	11
Colorado:											
Denver	15	13	2	0	0	10	0	0	0	1	101
Pueblo	2	14	0	1	0	0	1	0	0	2	12
New Mexico:											
Albuquerque	2	0	0	0	0	5	0	0	0	0	12
Utah:											
Salt Lake City	3	2	2	6	0	2	1	0	0	14	26
Nevada:											
Reno	1	3	0	3	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	12	8	5	1			0	1		13	
Spokane	6	6	6	6			0	0		0	
Tacoma	2	2	3	0	0	0	0	1	0	4	29
Oregon:											
Portland	7	5	10	32	0	3	0	0	0	0	
California:											
Los Angeles	35	37	8	0	0	24	2	1	0	14	334
Sacramento	1	3	1	0	0	2	1	0	0	0	27
San Francisco	16	34	5	0	0	13	1	0	0	8	155

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	0	0	0	0	0	0	2	0
Worcester	1	0	0	0	0	0	0	0	0
Connecticut:									
Bridgeport	0	0	1	1	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
Buffalo	0	1	0	0	0	0	0	0	0
New York City	11	9	3	3	0	0	0	1	0
New Jersey:									
Newark	1	0	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	2	1	1	0	0	1	0	0	0
Pittsburgh [1]	0	0	0	0	0	0	0	2	0

[1] Rabies (human): 1 death at Pittsburgh, Pa., and 1 death at New Orleans, La.

City reports for week ended February 18, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	0	0	0	1	0	0	0	0	0
Cleveland	1	2	0	0	0	0	0	0	0
Toledo	2	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	0	2	0	0	0	0	0	0	0
Illinois:									
Chicago	6	2	1	0	0	0	1	1	0
Michigan:									
Detroit	0	1	0	1	0	0	1	0	0
Wisconsin:									
Milwaukee	1	0	0	0	0	0	1	0	0
WEST NORTH CENTRAL									
Missouri:									
St. Louis	3	0	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	4	1	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	1	0	0	0	0	0	0
Virginia:									
Richmond	0	0	0	0	0	1	0	1	0
South Carolina: [2]									
Columbia	0	0	0	0	0	1	0	0	0
Georgia:									
Atlanta	1	0	0	0	0	2	0	0	0
Florida:									
Miami	0	0	0	0	1	0	0	0	0
Tampa [3]	0	1	0	0	0	0	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	0	1	1	0	0	0
Nashville	0	0	1	0	0	0	0	0	0
Alabama:									
Mobile	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	2	0	0	0
Louisiana:									
New Orleans [1]	0	0	0	0	1	2	0	0	0
Shreveport	0	0	0	0	0	1	0	0	0
Oklahoma:									
Tulsa	1	0	0	0	0	0	0	0	0
Texas:									
Fort Worth	0	0	0	0	0	1	0	0	0
Houston	1	1	0	0	0	0	0	0	0
MOUNTAIN									
Montana:									
Missoula	1	0	0	0	0	0	0	0	0
Colorado:									
Denver	3	2	0	0	0	0	0	0	0
Utah:									
Salt Lake City	0	0	0	0	0	0	0	1	0
Nevada:									
Reno	2	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	3	....	0	....	0	....	0	0	....
California:									
Los Angeles	1	0	0	0	0	0	0	1	0
San Francisco	2	1	0	0	0	0	0	0	0

[1] Rabies (human): 1 death at Pittsburgh, Pa., and 1 death at New Orleans, La.
[2] Dengue: 2 cases at Charleston, S. C.
[3] Typhus fever: 1 case at Tampa, Fla.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended February 18, 1928, compared with those for a like period ended February 19, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, January 15 to February 18, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928
101 cities	175	193	177	[2] 193	194	190	177	[3] 168	208	[4] 177
New England	151	168	163	172	146	193	174	186	133	172
Middle Atlantic	191	252	194	251	229	278	188	[3] 235	277	234
East North Central	170	192	175	186	201	145	179	175	168	169
West North Central	146	138	127	131	123	113	154	99	164	[4] 139
South Atlantic	161	146	198	146	143	167	222	112	191	149
East South Central	152	105	101	[2] 87	127	55	61	55	86	55
West South Central	170	152	203	164	232	152	149	128	170	124
Mountain	117	166	197	124	188	106	152	44	161	166
Pacific	232	125	167	161	217	156	165	133	185	82

MEASLES CASE RATES

	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928
101 cities	451	619	425	[2] 583	570	724	652	[3] 734	810	[4] 905
New England	549	1,248	323	1,078	379	1,508	339	1,614	181	1,657
Middle Atlantic	49	478	46	483	41	618	45	[3] 467	68	700
East North Central	545	326	536	368	695	359	786	440	1,009	581
West North Central	277	259	297	138	453	222	683	216	564	[4] 284
South Atlantic	801	1,675	256	1,533	536	1,822	359	1,959	792	2,246
East South Central	203	1,387	188	[2] 1,621	269	1,192	451	1,132	467	1,347
West South Central	447	560	376	500	562	916	451	1,304	562	1,899
Mountain	5,074	97	4,447	88	7,217	115	7,845	186	9,665	97
Pacific	1,342	531	1,504	434	1,538	708	2,220	718	2,774	692

SCARLET FEVER CASE RATES

	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928
101 cities	384	269	386	[2] 278	403	270	390	[3] 207	438	[4] 290
New England	537	508	539	372	509	359	587	432	470	441
Middle Atlantic	368	268	378	288	433	295	423	[3] 327	581	330
East North Central	336	286	347	301	324	289	325	310	322	280
West North Central	517	224	487	273	521	247	499	290	540	[4] 243
South Atlantic	280	207	253	200	245	207	258	231	249	228
East South Central	335	190	319	[2] 116	243	130	223	135	243	190
West South Central	194	88	112	128	124	132	74	100	66	116
Mountain	1,345	265	1,605	301	1,515	380	1,246	540	1,246	345
Pacific	319	240	326	296	436	217	369	192	340	230

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] Louisville, Ky., not included.
[3] Buffalo, N. Y., not included.
[4] Duluth, Minn., and Kansas City, Mo., not included.

Summary of weekly reports from cities, January 15 to February 18, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued.

SMALLPOX CASE RATES

	Week ended—									
	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928
101 cities	20	22	26	[2] 23	25	21	26	[3] 22	33	[4] 20
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	1	0	0	0	0	0	0	[3] 1	0	0
East North Central	17	9	17	12	22	9	15	14	28	12
West North Central	59	121	79	121	53	117	71	109	81	[4] 123
South Atlantic	34	14	60	14	43	18	63	21	60	26
East South Central	25	55	86	[2] 29	101	20	81	15	132	25
West South Central	62	4	41	20	79	12	66	16	62	20
Mountain	0	106	9	133	9	115	18	44	27	168
Pacific	63	64	71	59	63	59	76	69	94	18

TYPHOID FEVER CASE RATES

	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928
101 cities	7	6	7	[2] 8	7	7	7	[3] 7	9	[4] 5
New England	2	9	5	21	9	14	5	9	2	5
Middle Atlantic	5	3	4	5	9	5	5	[3] 6	10	3
East North Central	6	6	2	5	5	3	3	6	4	3
West North Central	4	2	8	8	4	2	6	6	10	[4] 5
South Atlantic	7	5	18	7	5	5	18	9	28	7
East South Central	10	30	35	[2] 29	5	15	10	5	30	15
West South Central	4	12	0	40	17	40	12	40	8	12
Mountain	27	9	18	0	0	9	0	0	0	0
Pacific	21	8	21	0	8	10	18	0	3	8

INFLUENZA DEATH RATES

	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928
95 cities	21	24	25	[2] 19	19	19	24	[3] 17	23	[4] 22
New England	5	18	9	7	5	9	2	7	9	11
Middle Atlantic	20	19	22	16	21	14	28	[3] 14	25	18
East North Central	25	17	21	12	9	13	22	10	19	12
West North Central	4	18	4	10	12	10	14	4	23	[4] 5
South Atlantic	20	26	49	11	27	23	23	30	31	35
East South Central	16	105	32	[2] 101	58	68	37	42	43	37
West South Central	42	66	72	78	64	45	38	57	38	90
Mountain	54	71	72	80	45	53	72	53	27	71
Pacific	31	17	14	20	7	34	21	20	17	27

PNEUMONIA DEATH RATES

	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928
95 cities	183	170	158	[2] 159	168	150	147	[3] 167	146	[4] 174
New England	207	156	158	126	188	126	165	149	102	170
Middle Atlantic	197	193	174	183	197	129	173	[3] 200	148	195
East North Central	138	137	132	121	121	129	128	114	121	137
West North Central	116	137	126	98	135	49	95	106	91	[4] 71
South Atlantic	278	231	189	210	222	198	168	224	234	216
East South Central	255	251	213	[2] 171	207	131	117	235	175	204
West South Central	195	308	200	267	149	209	144	201	204	279
Mountain	215	186	170	177	143	203	143	150	188	168
Pacific	134	142	107	145	121	128	114	182	176	172

[2] Louisville, Ky., not included.
[3] Buffalo, N. Y., not included.
[4] Duluth, Minn., and Kansas City, Mo., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,360,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,000	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended February 4, 1928.—The following report for the week ended February 4, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations located at Singapore to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Suez.
Aden Protectorate.—Aden.
India.—Bombay, Rangoon
Ceylon.—Colombo.
Dutch East Indies. Makassar.

CHOLERA

India.—Bassein, Calcutta, Rangoon
Siam. Bangkok.

SMALLPOX

Ceylon.—Colombo.
India.—Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon, Tuticorin, Vizagapatam.
French India.—Pondicherry.
Dutch East Indies.—Banjermasin, Belawan-Deli Pontianak.
Straits Settlements. Singapore.
China.—Hong Kong, Shanghai.
Kwantung.—Dairen
Manchuria.—Mukden

Returns for the week ended February 4 were not received from Balikpapan, Dutch East Indies, Canton, China, or Vladivostok, Union of Socialist Soviet Republics.

ANGOLA

Epidemic cerebrospinal meningitis in the plateau region—Suspect plague at Benguela.—Under date of January 11, 1928, epidemic cerebrospinal meningitis was reported present in the high plateau region of Angola. Under the same date two suspect cases of plague were reported at Benguela.

ARABIA

Aden—Plague—Increased prevalence—January 31, 1928.—Information received from Aden, Arabia, under date of January 31, 1928, shows increased prevalence of plague at that port, with 77 cases and 33 deaths reported to that date. The history of the outbreak indicates that plague was discovered January 9, and that 27 cases with 13 deaths were reported from that date to January 11, 1928. The disease was stated at that date to be confined to a section of the town inhabited by coal coolies. This population group was removed and isolated in quarantine. On January 24, spread of infection outside the original focus and contacts was noted and plague was stated to be present in epidemic form.

BELGIAN CONGO

Boma—Matadi—Yellow fever—December 24, 1927, to January 19, 1928.—Information from the Government of Belgium, dated February 4, 1928, shows 1 fatal case of yellow fever at Boma, Belgian Congo, in a sailor from the steamship *Manpoko*, and 31 cases with 18 deaths at Matadi, Belgian Congo, from December 24, 1927, to January 19, 1928. Of the cases at Matadi, 16 with 8 deaths were in Europeans.

CANADA

Provinces—Communicable diseases—Week ended February 18, 1928.—The Canadian Department of Health reports cases of certain communicable diseases from six Provinces of Canada for the week ended February 18, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Total
Influenza	18			4			22
Lethargic encephalitis					1		1
Smallpox				40		7	47
Typhoid fever			29	5		1	35

Quebec Province—Communicable diseases—Week ended February 18, 1928.—The Bureau of Health reports cases of certain communicable diseases for the week ended February 18, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	40	Scarlet fever	128
Diphtheria	48	Smallpox	11
German measles	3	Tuberculosis	44
Influenza	7	Typhoid fever	31
Measles	251	Whooping cough	14

Quebec Province—Vital statistics—December, 1927.—Births and deaths in the Province of Quebec for the month of December, 1927, were reported as follows:

Estimated population	2,604,000	Deaths from—Continued	
Births	6,071	Heart disease	839
Birth rate per 1,000 population	28.0	Influenza	68
Deaths	2,724	Measles	16
Death rate per 1,000 population	12.6	Pneumonia	245
Deaths under 1 year	698	Poliomyelitis	1
Infant mortality rate	115	Scarlet fever	16
Deaths from—		Smallpox	2
Accidents	61	Syphilis	2
Cancer	118	Tuberculosis (pulmonary)	168
Cerebrospinal meningitis	5	Tuberculosis (other forms)	35
Diabetes	19	Typhoid fever	16
Diarrhea	123	Whooping cough	37
Diphtheria	51		

ECUADOR

Guayaquil—Plague—Infected rats—January, 1928.—During the month of January, 1928, four cases of plague with four deaths were reported at Guayaquil, Ecuador. During the same period, 23,812 rats were reported examined at Guayaquil and 23 rats found plague infected.

Smallpox.—During the two weeks ended January 15, 1928, two cases of smallpox were reported at Guayaquil.

EGYPT

Plague—Province of Assiout—Suez—January 31–February 1, 1928.—Plague has been reported in Egypt as follows: Assiout Province, one fatal case, bubonic; Suez, two fatal cases, one bubonic, one septicemic.

ESTONIA

Communicable diseases—December, 1927.—During the month of December, 1927, communicable diseases were reported in the Republic of Estonia as follows:

Disease	Cases	Disease	Cases
Diphtheria	50	Tuberculosis	108
Measles	46	Typhoid fever	28
Scarlet fever	493		

Population, officially estimated, 1,114,630.

MADAGASCAR

Plague—December 1–15, 1927.—During the period December 1 to 15, 1928, 145 cases of plague with 134 deaths were reported in the Island of Madagascar. The occurrence was distributed according to Provinces as follows: Antisirabe, cases and deaths, 34; Itasy, cases 25, deaths, 24; Moramanga, cases 17, deaths 14; Tananarive, exclusive of the town of Tananarive, cases 55, deaths 49; Tananarive Town, cases 14, deaths 13. The distribution according to type was: Bubonic, cases 91; pneumonic, 19; septicemic, 35. Mortality according to type was: Bubonic, 80 deaths; pneumonic, 19; septicemic, 35.

MEXICO

Epidemic smallpox—Typhoid fever—State of Jalisco, Mexico—February, 1928.—According to press reports dated February 11, 1928, smallpox in epidemic form was reported present in the Los Altos region of the State of Jalisco, Mexico, the principal urban locality affected being the town of Atotonilco el Alto. Some prevalence of typhoid fever was also reported. The epidemic outbreak was explained as being induced by concentration of population in the region affected, due to local disturbances in the Los Altos district.

POLAND

Communicable diseases—1927.—The following table gives a summary of the number of the principal communicable diseases reported in Poland for the year 1927, with the deaths from these diseases and the case and death rates per 100,000 population.

Disease	Cases	Deaths	Rates per 100,000	
			Cases	Deaths
Diptheria	9,685	838	32.2	2.7
Measles	41,888	901	139.6	3
Scarlet fever	36,379	3,224	121.1	10.7
Trachoma	13,029		43.7	
Typhoid fever	19,129	1,477	63.7	4.9
Typhus fever	2,934	266	9.7	.8
Whooping cough	9,478	719	31.5	2 3

VIRGIN ISLANDS

Communicable diseases—January, 1928.—During the month of January, 1928, communicable diseases were reported in the Virgin Islands of the United States as follows:

Island and disease	Cases	Remarks
St. Thomas and St. John:		
Chancroid	1	
Dengue	4	
Erysipelas	1	St. John.
Gonorrhea	3	
Malaria	2	Benign tert n.
Syphilis	1	Secondary.
Tetanus	2	
Tuberculosis	1	Chronic pulmonary.
Whooping cough	2	
St. Croix:		
Diphtheria	1	
Gonorrhea	1	
Syphilis	9	Secondary
Uncinariasis	4	Necator americanus

YUGOSLAVIA

Communicable diseases—January, 1928.—During the month of January, 1928, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	17	4	Poliomyelitis		1
Cerebrospinal meningitis	11	7	Rabies	1	1
Diphtheria	235	59	Scarlet fever	1,548	216
Dysentery	23	1	Tetanus	10	2
Leprosy	1		Typhoid fever	262	33
Measles	2,141	28	Typhus fever	7	3

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	Feb. 4, 1928
China:																				
Amoy	C	2	28	72	16															
	D		7	3																
Canton	C	8	31	36	14	5	1	6			1									
	D	5	16	25	14	5	1	5			1									
Foochow	C	P	P	P	P															
Hong Kong	C	2	P	1	P															
	D	1																		
Shanghai (settlement and concession)—																				
Foreigners only	C		1	6	3															
Including natives	D		20	74	7															
Swatow	C	72	42	P	P	P	P													
	D	1		P	P	P	P													
Tientsin	C	P	P	15	2	P	P													
Dutch East Indies: Java—Batavia	C						1	2	25	2	1									
	D						1	2	15	2	1									
India	C	46, 137	45, 163	31, 390	20, 160	5, 303	4, 845	5, 987	6, 912	8, 102	5, 997	5, 766	5, 274	4, 624	3, 960					
	D	24, 081	22. 051	15, 895	10, 371	2, 867	2, 641	3, 350	4, 005	4, 835	3, 672	3, 355	3, 164	2, 617	2, 353					
Bassein	D	16																		1
Bombay	C	75	42	3				2												
	D	35	30	2				2												
Calcutta	C	96	87	76	101	28	35	65	71	156	119	87	66	69	42	43	22	39		
	D	48	40	39	64	22	25	42	49	106	77	55	43	48	34	27	16	18	24	38
Madras	C	[illegible]	547	59	14			6	7			1					1	1		
	D	[illegible]	278	48	8			3	4	1		1					1			3
Madras Presidency	C	11, [illegible]	7, 660	3, 056	2, 050	432	498	856	1, 287	1, 484	861	878	479	503	382					
	D	4, 807	3. 513	1, 581	1. 055	246	282	459	749	802	528	491	283	241	209					
Negapatam	D	2	4																1	
Rangoon	C	2	1	2	6		1		1	3	1	2	2	1	2		1	4		
	D	2	1	2	5	1			4	2	1	2	1	1	1		1			1
Tuticorin	C				1						6		2							
	D				1	7	5	10	15		6	6	2							

India (French):																			
Chandernagor	C	1	1	1					6	2	2	2	2	6	3	4			
	D	1	1						6	2	2	2	2	4	2	2			
Karikal	C	56	18	1			1						1			6			
	D	45	12	1			1						1			4			
Pondicherry	C	37	12	15			1				5	3	17	4	1	2			
	D	24	11	15			1				5	1	15	6	1	2			
Indo-China: Saigon	C			1	1											2	1	1	1
	D															1			
Iraq [1]																			
Japan: Yokohama	C	1																	
	D	1																	
Philippine Islands: Manila	C	1	1																
Siam	C	81	77	40	18	14	23	43	30	19	29	18	32	24	24	13	49		
	D	59	53	24	11	10	15	25	26	11	19	13	21	18	21	5	36		
Bangkok	C	6	2	3	5		1		3		1	1	1	2	3	7	9	11	28
	D	1	1	1	3		1		1		1		1	2	1	3	5	7	16
Straits Settlements: Singapore	C					1		4	2	1	2		2	3	15	3	2	1	
	D					1		4		2			2	1	4	5	2	2	
On vessel:																			
S. S. Adrastus: At Yokohama, Japan	C		1																
	D		1																
S. S. Tabaristan: At Basra, Iraq	C				1														

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928	
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Indo-China (French):													
Annam	C	911	1,628	640	226	13	75	38	16	2		79	95
Cambodia	C	87	89	75	180	56	1	28	21	12	39	30	9
Cochin-China	C	257	68	144	178	21	27	52	17	38	58	46	119
Laos	C	20	190	36	67	10							
Tonkin	C	1,093	180	24	1			1			2	1	
Kwangchow-wan	C		1	15									

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death, Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 29, 1927	November, 1927				December, 1927					January, 1928				February, 1928		
							5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18
Algeria: Oran	C		4	1			1		1													
	D		3	1																		
Arabia: Aden	C																19	13	22	54	89	
	D																7	8	8	33	55	
Argentina:																						
Bahia Blanca district	C									1	1	1										
Buenos Aires	C																				2	
Cordoba Province	C		2		P	P	P			10				1	1							
Entre Rios	C		5																			
Firmat	C												1									
Quilino	C									1	1	1										
Rosario	C									1	1	1	1	2	3				4			1
Santiago Province	C																					1
Ucacha	C												1									
Azores: St. Michaels Island	C	2	2	2	3	1		1	1	1	1	1		1		1		3				
	D			1	1							1					1	1				
Brazil: Rio de Janeiro	C																	2				3
British East Africa:																						
Tanganyiki	C	P	P		P	P	P	P	P	P	P	P	P	P								
Uganda	C	528	456	226	99	54	7	18	40	24												
	D	413	345	158	88	34	9	14	39	21												
Canary Islands:																						
Las Palmas	C				9					1			2			2	1	1				
Santa Cruz	C																	1				
Teneriffe	C																	1	3	3	3	
Ceylon: Colombo	C		1	3	1					1	1		4	3	2	1	1	1	1	1		
	D			3								2	4	3	1	1	1	1	1			
China:																						
Amoy	C	P																				
Tungliao	D				200																	
Tientsin	C		2																			

Dutch East Indies:																					
Balik-Papan	C													1							
	D													1							
Celebes: Makassar	C						2	2	2	1		1		2	1		3	2	1	1	1
	D						2	2	2	1		1		2	1		2	2	1	1	1
Java	D			432	779	191	213	228	197	291	275										
Batavia and West Java	C	40	71	68	130	41	29	31	34	45	43	32	34	32	36	24	36				
	D	40	71	68	129	41	29	31	34	44	43	32	33	32	36	24	36				
Cheribon	C										1										
	D										1										
East Java and Madura	C	29	28	18	17	3	4	2	1	5	3			3	2	1					
	D	29	27	18	17	3	4	2	1	5	3			3	2	1					
Pasoeroean Residency	C									P	P	P									
Surabaya Residency	C										P										
Surakarta Residency	C								P	P	P										
Egypt:																					
Alexandria	C		2	1						5	3	2	2	3	2						
	D									5	2			1	1						
Suez	C			1													1	1		3	
	D																1	1		1	
Greece:																					
Athens and Piraeus	C		1	3	1										2	1					
	D				1										1						
Mitylene	C		1	5	1	1		2		1	1	1									
Patras	C		2	2	1		1														
	D				1		1														
Hawaii Territory: Hawaii	D		1																		
India	C	404	1,391	2,710	3,246	812	1,015	856	919	1,193	1,228	1,348	1,749	1,085	1,197						
	D	241	836	1,428	1,792	495	551	485	554	668	742	773	1,085	733	899						
Bassein	D	23	12	14	8		1	2	1	3			1	2	13	2		3	3		2
Bombay	C	14	14	7	4										1		2	5			
	D	13	11	5	3										1		1	2	2	2	2
Calcutta	C			18																	
	D			10															1		
Madras Presidency	C	255	620	465	583	149	83	152	86	190	158	220	223	174	167	56					
	D	115	321	230	298	63	54	80	85	111	61	108	79	69	27	38					
Rangoon	C	21	15	6	11	5	2		4	5	2	6	2	2	4	4	7	8			
	D	20	14	6	11	5	2		4	5	2	5	3	2	3	4	7	7	7	6	10
Indo-China: Saigon	C			2					1												
Nigeria: Lagos	C					7	4	3	3	4	3	4	2	2	1	1	6	2	3	3	
	D					7	4	3	3	4	3	3	3	1	1	1	5	3	3	3	
Senegal:																					
Baol	C	41	23	72	95				P		P										
	D	22	13	33	40																
Cayor	C	126	227	463	176	32	8	8	P												
	D	74	166	233	88	20	4	4													
Dakar	C	67	46	20	1																
	D	41	32	12																	
Louga	C			5	8																
	D			4																	
M'Bour	C	28																			
	D	23																			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, Deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927 5	November, 1927 12	November, 1927 19	November, 1927 26	December, 1927 3	December, 1927 10	December, 1927 17	December, 1927 24	December, 1927 31	January, 1928 7	January, 1928 14	January, 1928 21	January, 1928 28	February, 1928 4	February, 1928 11	February, 1928 18
Senegal—Continued.																						
Rufisque	C	104	44	16																		
	D	82	38	12																		
Thies	C	7		9	1	1																
	D	3		7																		
Tivaouane	C	43																				
	D	29																				
Siam	C				13					2			1	1	7	4	4					
	D				9		1			1			1	1	1	5	4					
Bangkok	C				2										1				1			
	D						1								1				1			
Straits Settlements: Singapore	C								1												1	
	D								1												1	
Turkey: Constantinople	C			1	1					1	1											
	D				1						1											
Union of South Africa:																						
Cape Providence	C					2						2										
	D					2						1										
Orange Free State	C	4							1	8	P											
	D	4							1	6												
U. S. S. R.:																						
Chita district	C				1																	
	D				1																	
Northern Caucasus	C			14	1																	
	D			10																		
On vessel:																						
At La Plata, from Rosario, Argentina	C														1							
S. S. Aghios Gerasimos at Vigo, Spain	C								3													

Beirut, Syria, 1 case, Dec. 1-10.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July	August	September	October	November	December	January
Algeria: Algiers	C				2			
British East Africa: Kenya	C	13	61	21	18	28	16	
Ecuador: Guayaquil	C	5	7	3	4	9	5	4
	D					3	2	4
Indo-China (French)	C			14	3	3	3	
Madagascar	C	46	98	170	166	209	317	
	D	43	89	154	155	189	261	
Ambositra Province	C	6	1		6	1	18	
	D	6	1		6	1	10	
Antisirabe Province	C		34	5	19	18	72	
	D		34	4	19	17	72	
Itasy Province	C	14	11	21	16	26	62	
	D	14	7	20	15	25	54	
Madagascar—Continued.								
Moramanga Province	C	5	4	3	24	46	25	
	D	5	4	3	20	41	22	
Tananarive Province	C	21	48	142	99	170	139	
	D	19	43	127	93	153	108	
Mauritius	C			1				
Nigeria	C	9	8	15	27	16	20	
	D	7	8	14	27	16		
Peru	C	8	11	15	14	6	14	
	D	7	6	6	5	2	4	
Callao	D	3					3	
Lima	C						7	
	D				1	1	1	

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 29, 1927	Week ended— November, 1927				December, 1927					January, 1928				February, 1928		
							5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18
Algeria	C	376	459	382	[illegible]		294	218	149		68	55	47	81	26				18	11		
Algiers	C				[illegible]								3	3	4		2	3	1	7		
Oran	C	14	9	16	11		10	4	6	9	11	10	9	8	15	2	4	2	2	4		
Arabia: Aden	C	2							1		1	1	1	1								
	D	1																				
Brazil:																						
Para	C		1																			
Rio de Janeiro	C	4	6	10		1																
	D	4	4	9		1																
British East Africa: Tanganyika	D		21	8	P	P	P	P	P	P	P	P										

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3–30, 1927	July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	24	February, 1928: 4	11	18
British South Africa:																						
Northern Rhodesia	C	48	55	39	164	150	10	22	3	57	15	125	55	2	81	141	12					
	D	2	1	2	11	40	23		1	18	7	28	9		8	23						
Southern Rhodesia	C								3				2	1								
Canada:																						
Alberta	C	42	17	17	23	6	2	1	1	7	3	3	6		3	3	5	1	19	1	6	
Calgary	C	5	1																			
Edmonton	C				1	1				6		1	1			3	2	1			2	
British Columbia: Vancouver	C			2								4		1	3	3	1	11	3	1		
Manitoba	C		13	9	7	3	14		2	1	3	1	2	2	2	2	5		1			
Winnipeg	C	3	5	4	2				2			1	1	1			1	1	1			
New Brunswick	C			2										1								
Nova Scotia	C			1	1																	
Halifax	C				1																	
Ontario	C	63	60	22	96	64	38	77	85	71	90	82	104		53	83	76	52	77	63	51	40
Hamilton	C										2											
Kingston	C								1					1							1	
Ottawa	C	37	27	40	67	47	17	51	19	10	19		34	18	9	10	23	20	16	23	9	11
Toronto	C	5		2	10	2	16	3	13		25	14		7		11	10	8	5	1	6	4
Windsor	C				9																	
Quebec	C	12	1		8	7	3	12	3	8	5	3		14	3	10	17	7		11	8	11
Montreal	C							1						1		1	6	3	4	1		5
Quebec	C										2		2		2		3		5			
Riviere du Loup	C								3													
Saskatchewan	C	25	14	68	31	5	12	2	14	9	15	19	15	12	13	15	12	39	15	9	34	7
Moose Jaw	C		10	16	3								1		1	2	1	4	2	3	2	
Regina	C	2	8		5			1					1									
Saskatoon	C											2			4			13	1		1	
Ceylon: Colombo	C		1					1			2							1			2	
	D		1								1							1				
China:																						
Antung	C	3															1					
Canton	C			1																		
	D			1																		
Chefoo	C			1	P					P												
	D			1																		

Foochow	C	P	P	P	P		P			P		P	P	P	P		P				
Hong Kong	C	3	1	2													1	1			
	D	3	1	2												1					
Manchuria—																					
Changchun	C	4								1									4		
Dairen	C				1		2						1								
	D				1																
Fushun	C	1		1				1													
Harbin	C	1											2		1				2		
Mukden	C	3			2	1													1		
Pensihu	C	1			1																
Tientsin	C	11		4	13	8				4	1	2	2	2							
Curacao (Alastrim)	C																	2			
Dutch East Indies:																					
Borneo—																					
Samarinda District	C					P															
South and East Borneo Residency	C		P																		
Java:																					
Batavia and West Java	C	2	4		4			25													
	D							15													
East Java and Madura	C	8	4	22	8	1	3	5		4	3	2			3	1					
	D				1																
Sumatra: Medan	C												3		8		1				
	D												2		1		2				
Egypt	C	4		3							4			4							
	D			1	1							1									
Cairo	C									1	1										
Great Britain:																					
England and Wales	C	721	568	508	473	199	219	258	226	233	366	230	212	255	247	275	398	405	370	386	389
Birmingham	C		1		1													14	17	11	2
Bradford	C					1	5	3	2	9	6	2	2	2	2	4	24	6	9	7	2
Bristol	C				6	1			3	2	4	2							2		1
Cardiff	C					1										1					
Leeds	C	2	5	3	7	1	1	1	2	3	3	6	4	4	6	1		1			2
Liverpool	C																1				
London	C																	2		1	5
Manchester	C				3		1	1	4	2	5	10	8		1	2	2	11	6	4	4
Newcastle-upon-Tyne	C	1	1	2	6	2	6		1	28	18	5	4	2	13	2	5	14	3	4	6
Nottingham	C															7	6	4	8	6	9
Sheffield	C	11	2	1	10	4			2	1	8			3		1	10	4		4	
Stoke-on-Trent	C	1	1													3	1			1	
Greece: Saloniki	D	1	2																		
Guinea (French): Beyla	C	9																			
India	C	11,340	5,911	4,398	3,153	779	805	1,235	1,233	1,031	1,556	1,939	2,205	2,225	2,502						
	D	3,140	1,668	1,120	715	190	200	211	326	307	359	465	519	515	578						
Bassein	C		1																	1	
	D		1																		
Bombay	C	38	33	12	10	2		2			4		5		4	4	6	10	23	10	18
	D	21	19	8	2	2		1			1		1					2	8	7	7
Calcutta	C	93	27	22	5				5	4	3	11	7		17	9	14	14	11	23	10
	D	70	25		6				2	2	1	6	2		17	4	6	10	7	10	7

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927 5	12	19	26	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	February, 1928 4	11	18
India—Continued.																						
Madras	C	4	6	7	8	3		2	2	2	2	5	2	2		11	8	9	16	20	29	
	D	1		2		1		1		1	1	1		1		4	1	3	2	2	1	
Negapatam	C	3	3	1													5		4	2	2	
	D	2	2	1													3		2	1		
Rangoon	C	37	14	9	17	4		1	1	5	2	1	6	36	28	23	49	41	34	103	197	
	D	11	3	2	3	1				1	1		2	5	13	4	9	13	10	18	23	
Visagapatam	C	11		3												3		2	1	5	2	
	D	4		2														6	1		1	
India (French):																						
Karikal	C	2	3	1	2		P															
	D	2	3	1	2																	
Pondicherry	C	22	39	37	38	9	10	13	10	15	6	6	14	6								
	D	20	31	37	38	9	10	13	10	15	6	6	14	6								
Indo-China: Saigon	C	1	1	1									1		1	1	1					
Iraq:																						
Baghdad	C			1	7			5		1	5	7	12	9	9	3	2					
	D			1	4			4			5	4	5	7	3	2						
Basra	C	1	1	4	2				3		2	2			2							
	D	1	1	4	2				1		2	1			1							
Italy: (Rome and vicinity)	C	1		1																		
Jamaica (outside Kingston) (alastrim)	C	15	6	9	9	7				1		1	1		2				4			
Kingston	C			3	2																	
Japan: Nagasaki	C	17	2																			
	D	5	1																			
Mexico:																						
Acapulco	C			2				1														
	D			2				1														
Chihuahua	D															1						
Guadalajara	D									1			1									
Manzanillo	D																1					
Mexico City and surrounding territory	C									1	1	1	1							1		
Monterey	C	6																				
	D	4																				

San Luis Potosi	D	4	1																			
Torreon	D		1		2																	
Palestine: Jerusalem	C										1											
Paraguay	D	2																				
Persia: Teheran	D	2																				
Poland	C	7	2										1	5								
	D	2	1																			
Portugal:																						
Lisbon	C	4		3	8	1	2		1		3	3	4	1	2	4	5	5	2	2		
	D												1									
Oporto	C			1																		
Siam	C	34	51	27	6				1		8		1	2	5	8	8					
	D	9	10	15									1			2						
Bangkok	C	5		3					1		1				1	2						
	D	1		1												1						
Spain:																						
Malaga	D								1	1												
Seville	C																1					
Valencia	C				1										1	1						
Straits Settlements: Singapore	C							1														
Switzerland	C													2								
Tunisia: Tunis	C														2	2						
Union of South Africa:																						
Cape Province	C	P	P		P																	
Orange Free State	C		P						P	P	P	P	P	P								
Transvaal	C				P	7																
Venezuela: Maracaibo	D	1		2	1																	

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928		
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31
Algeria	C	376	459	382	682									
Oran	C	14	10	16	11									
Indo-China	C	19	3	21	25	13	3	22	10	4	20			18
Syria:														
Aleppo	C										1		1	
Beirut	C								1		1			
Damascus	C		3	5	22		13		4	6	2	11	2	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July	August	September	October	November	December	January
Angola	C	42	2	5	73			
	D				2			
Congo	C			5	77			
Cuanza-Norte	C			1				
Cuanza-Sul	C				2			
Loanda	C			1				
Zaire	C			3	4	1		
Brazil: Porto Alegre	C	5	3	3	4	1		
British East Africa: Zanzibar	C				2			
	D				1			
Chosen	C	19	2		2	2		
	D	6				1		
Ecuador, Guayaquil	C		2	2	1	1	4	2
France	C	23	6	8	7	4	14	
Gold Coast	C	1	1	5	4			

Place		July	August	September	October	November	December	January
Greece	C	3	3	4	4		1	6
Latvia	C				2			
Mexico	D	93	73	55				
Morocco	C	53	76	51	81	140	401	
Nigeria	C	492	91	237	223	93		
	D	83	20	70	51	30		
Persia	D					2		
Spain: Madrid	D					1		
U. S. S. R.:								
Railways, etc.	C	11	6	9				
Other territories in Europe	C	146	111	199				
Transcaucasus, Siberia, and Central Asia	C	36	29	15				
Ukraine	C	16	4					

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28
Algeria:																			
Algiers	C																		1
Oran	C													1	1	1	1		2
Bulgaria: Sofia	C				17	3	1	2					1	1	4	1		1	
	D						1												
Chile:																			
Antofagasta	D	1			1														
Talcahuano	D	1																	
Valparaiso	C	2		1				1		1	1						1		
	D		2	1				1	1										

China:																			
Manchuria—Harbin	C	3	2					1											
Tientsin	C	1		2															
Egypt	C	24	2		12		4			1	7	3	3	1					
	D	1	3		5						5	1	2						
Port Said	C				1						1								
Ireland (Irish Free State):																			
Cork County	C	1										3				1			
Donegal County, Letterkenny	C				4														
Mexico:																			
Guadalajara	D									1									
Mexico City, including municipalities in Federal District	C	16	17	19	18	9	6	2	11	7	6	4		4	4	4	3	2	1
	D						2						1	1	3	1			
Morocco	C															107	235	257	214
Palestine:																			
Haifa	C		4		2				1	1									
Herzlia	C									1									
Jaffa	C		2		1					1									
Nazareth	C	1	2						1										
Safad	C	1	2							1		1							
Tel-Aviv	C		1	1	2				1	1	1	1							
Poland	C	99	50	35	19	35	12	6	11	13	28	17	35	26	33	68	59	101	
	D	10	6	2	4	6	3		2	1	5		4	1	3	6	6	4	
Portugal: Oporto	C		1			1								1					
Rumania	C	27	36	16	17		11	9	2	6	8	8	13	32	17	19			
	D	4	1		2										2	1			
Syria: Aleppo	C			2												2			
Tunisia	C	29	14	1	3			1					1	1			5	4	
Union of South Africa:																			
Cape Province	C	P	P	P	P		P	P	P	P	P	P	P	P	1	P			
Natal	C	P	P	P	P		P	P	P	P	P	1	1	2	P	P	1		
Orange Free State	C	P			P							P							
Transvaal	C	18	1		5		P	P	P	P	P								

Place		1927				November, 1927			December, 1927			January, 1928
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10
Algeria	C	67	33	10	12							
	D	13										
Algiers	C	2	2	6	2							
Bulgaria	C	12	24	7	2						2	7
	D		1	2	1						1	
Morocco	C	148	76	7	11	5	14	7	5	6	75	
	D											

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		July	August	September	October	November	December
Argentina	C					1	
	D						1
China: Shanghai	D					1	
Chosen	C	72	17	1	16	26	
	D	8			1	2	
Chemulpo	C	1	2				
Gensan	C	2					
Seoul	C	2	3		2		
	D	1			1		
Czechoslovakia	C	6		6	1		6
Greece: Athens	C	1		2			1
Japan	C	1					
Latvia	C	6					
Lithuania	C	44	18	7	9	18	27
	D	5	8	1	1	1	1
Mexico	D	12	38	14	36		
Peru:							
Arequipa	D		2	1	2		
Lima	D	8					
U. S. S. R.:							
Railways, etc	C	30	22	25	23		
Transcaucasus, Siberia, and Central Asia	C	79	69	60	61		
Ukraine	C	96	85	114			
Other territories in Europe	C	732	552	555	521		
Yugoslavia	C	11	9		1	1	
	D	4	1				

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 29-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	Feb. 4, 1928
Ashanti: Obuasi	C		1																	
	D		1																	
Belgian Congo:																				
Boma	C														3					
	D														2					
Matadi	C														6	12	11	1	5	1
	D														2	6	8	2	5	
Dahomey:																				
Grand Popo	C									1										
	D									1										
Porto Novo	C	1																		
	D	1																		
Ivory Coast	C	1												1						
	D	1												1						

Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	9	16		6	7										
	D	3	9	21	31	8	10		4	6										
Dakar	C	1			12	3	6		5	2	1	4			1	1				
	D				7	2	4		4	2	1	4			1	1				
Geoul	C				1															
	D				1															
Goree Island	C			2																
	D			2																
Kebemer	C				2															
	D				2															
Kelle	C				2	1														
	D				1	1														
Keur Samba Kane	C					1	1													
	D						1													
Keur Madiop	C					1														
	D					1														
Khombole	C		3		3				1											
	D				3				1											
Louga	C				1	2	1	1												
	D				1	2	1	1												
Mekhe	C				1	1	2	2												
	D					1	1	1												
M'Dande	C				1		2	1												
	D				1		1													
Ouakham	C	2	2																	
	D		1																	
Pout	C			1																
	D			1																
Rufisque	C				1															
	D				1															
Saint Louis	C		2		1															
	D		2		1															
Sebikotane	C				1		2	1												
	D				1			1												
Thies	C	1		3	8	1	2	1	1											
	D	1		3	8	1	2	1	1											
Tiaroye	C			1																
	D			1																
Tivaouane	C			1																
Togoland	C		1																	
	D		1																	

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PREVALENCE OF DISEASE

PUBLIC HEALTH REPORTS

VOL. 43 MARCH 16, 1928 NO. 11

IMPORTANCE OF RESPIRATORY DISEASES AS A CAUSE OF DISABILITY AMONG INDUSTRIAL WORKERS[1]

By DEAN K. BRUNDAGE, *Assistant Statistician, United States Public Health Service*

A 10-year record of disabling illnesses among employees of the Edison Electric Illuminating Co. of Boston showed that 54 per cent of the absences on account of sickness among the men was caused by the respiratory[2] group of diseases. This record is of especial interest because it includes all disabilities lasting one working day or longer during the decade ending December 31, 1924.[3]

From the reports of a group of industrial sick-benefit associations, of cases of illness causing disability for eight consecutive days or longer among the male members of the associations, it was found that respiratory diseases caused 47 per cent of the illnesses. In these reports, which covered the period from 1921 to 1926, inclusive, the number of men included averaged nearly 100,000 annually, or a total of approximately 570,000 years of life under observation during the six-year period.[4]

Thus, whether we consider all cases of disabling sickness or only those which caused disability for a period longer than one week, we find that respiratory diseases constituted approximately one-half of the cases. From the standpoint of effect upon the absence rate in industry, no other disease group approached in importance the respiratory diseases. Among employees of the Edison Co. diseases of the respiratory system caused more absences from work than all other diseases put together.

TIME LOSSES CAUSED BY THE RESPIRATORY DISEASES

The sickness records of the Edison Co. revealed an annual loss of 3.23 calendar days of disability[5] from respiratory diseases per male employee, compared with 6.92 calendar days of disability from all

[1] From the Office of Industrial Hygiene and Sanitation in cooperation with the Office of Statistical Investigations of the United States Public Health Service.

[2] Including influenza and grippe, tuberculosis of the lungs, diseases of the pharynx and tonsils, colds and other diseases of the nasal fossae, etc., i. e. title numbers 11, 31, 109, and 97-107 in the International List of the Causes of Death, third revision, Paris, 1920.

[3] For details of this study, see "A Ten-Year Record of Absences from Work on Account of Sickness and Accidents." Pub. Health Rep., vol. 42, No. 8 (Feb. 25, 1927), pp. 529-550. (Reprint No. 1142)

[4] For more detailed information in regard to the reporting sick-benefit associations, see "Sickness Among Industrial Employees." Pub. Health Rep., Vol 41, No. 4 (Jan. 22, 1926), pp. 113-131. (Reprint No. 1060.)

[5] Number of calendar days intervening from the date disability began to the date of return to work.

causes of sickness per man on the pay roll. Diseases of the respiratory system, accordingly, accounted for 47 per cent of the time lost; and, as has been mentioned, for 54 per cent of the number of absences due to illness.

The records of the reporting sick-benefit associations show a smaller proportion of time lost from the respiratory diseases. In the associations having a benefit period of 13 weeks, this disease group caused 34 per cent of total calendar days of disability from all diseases; in the associations with a benefit period of 26 weeks the percentage was 35; and in those associations in which the maximum period of benefit payments is 52 weeks, respiratory diseases caused 32 per cent of the total number of days of disability. In the sick-benefit associations, however, no record is kept of the time lost after the close of the benefit period for those members who are still disabled after they have drawn maximum benefits, and hence these time-lost percentages are not as accurate as those based on the number of days lost among employees of the Edison Co.

TABLE 1.—*Respiratory diseases causing absence from work for one day or longer among employees of the Edison Electric Illuminating Co. of Boston in the 10 years ending December 31, 1924*

Respiratory diseases causing disability (with corresponding title numbers in parentheses from the International List of the Causes of Death, Third Revision, Paris, 1920)	Number of absences	Number of days of disability [1]	Annual number of absences per 1,000 on the pay roll	Calendar days per absence [1]	Annual number of days of disability per person on the pay roll
MALES (18,172 years of life under observation)					
Sickness, exclusive of accidents (1-136, 151-158, 205)	18,879	125,694	1,039	6.66	6.917
Respiratory diseases (11, 31, 97-107, 109)	10,254	58,702	564	5.72	3.230
Diseases of the nasal fossae and their annexa (97)	7,266	24,817	400	3.42	1.366
Bronchitis—acute and chronic (99)	336	4,421	18	13.16	.243
Diseases of the larynx (98)	101	529	6	5.24	.029
Diseases of the pharynx and tonsils (109)	1,261	6,812	69	5.40	.375
Influenza and grippe (11)	919	9,023	51	9.82	.496
Tuberculosis of the respiratory system (31)	41	6,699	2	163.39	.369
Pneumonia, all forms (100, 101)	107	4,261	6	39.82	.234
Pleurisy (102)	169	1,300	9	7.69	.072
Other diseases of the respiratory system (103-107)	54	840	3	15.56	.046
FEMALES (3,749 years of life under observation)					
Sickness, exclusive of accidents (1-158, 205)	8,191	48,333	2,185	5.90	12.892
Respiratory diseases (11, 31, 97-107, 109)	3,686	20,687	983	5.61	5.519
Diseases of the nasal fossae and their annexa (97)	2,572	8,046	686	3.13	2.146
Bronchitis—acute and chronic (99)	99	1,967	26	19.87	.525
Diseases of the larynx (98)	77	306	21	3.97	.082
Diseases of the pharynx and tonsils (109)	640	3,437	171	5.37	.917
Influenza and grippe (11)	222	3,535	59	15.92	.943
Tuberculosis of the respiratory system (31)	11	1,783	3	162.09	.476
Pneumonia, all forms (100, 101)	18	867	5	48.17	.231
Pleurisy (102)	32	204	8	6.38	.054
Other diseases of the respiratory system (103-107)	15	542	4	36.13	.145

[1] Number of calendar days from the date disability began to the date of return to work.

TABLE 2.—*Respiratory diseases causing disability for eight consecutive days or longer among a group of men employed in several different industries. Average annual frequency, 1921–1926, inclusive*

(Number of years of life under observation 570,012)

Respiratory diseases (with corresponding title numbers in parentheses from the International List of the Causes of Death, third revision, Paris, 1920)	Annual number of cases per 1,000 men	Number of cases
Sickness, exclusive of accidents [1]	90.9	51,823
Respiratory diseases (11, 31, 97–107, 109)	43.1	24,549
Bronchitis—acute and chronic (99)	5.7	3,238
Diseases of the pharynx and tonsils (109)	6.4	3,619
Influenza and grippe (11)	20.8	11,869
Tuberculosis of the respiratory system (31)	1.5	837
Pneumonia, all forms (100, 101)	3.3	1,884
Other diseases of the respiratory system (103–107)	5.4	3,102

[1] An understatement of the number of cases causing disability for more than one week, because most of the reporting industrial mutual associations do not pay sick benefits for the venereal diseases, for illness resulting from the violation of any civil law, for the results of willful or gross negligence, and for certain other causes. Some associations do not pay for chronic diseases contracted prior to the date of joining the organization, nor for disabilities caused by or growing out of specific physical defects.

RELATIVE FREQUENCY OF THE DIFFERENT RESPIRATORY DISEASES CAUSING DISABILITY

The record of disabilities of one day or longer during the 10 years from 1915 to 1924, inclusive, showed that the common cold was by far the worst offender in the family of respiratory diseases as a cause of disability among a group of male employees. Diseases of the nasal fossae (mostly colds) occurred at nearly six times the rate of diseases of the pharynx and tonsils, which was the next most frequent respiratory disease group. Influenza and grippe occupied third place, and bronchitis fourth. The rates as shown in Table 1 were as follows:

Relative frequency of different respiratory diseases causing disability for one day or longer—Experience of male employees of the Edison Electric Illuminating Co. of Boston, 1915–1924, inclusive

Respiratory diseases	Annual number of absences per 1,000 men	Per cent of total respiratory cases
All respiratory diseases	564	100
1. Colds and other diseases of nasal fossæ	400	71
2. Diseases of the pharynx and tonsils	69	12
3. Influenza and grippe	51	9
4. Bronchitis	18	3
All other respiratory diseases	26	5

The respiratory picture is rather different when one leaves out of account the disabilities lasting one week or less, as is done in the data of the sick-benefit organizations. The common cold, which caused 71 per cent of the absences from diseases of the respiratory system, disabling 4 out of 10 men for 3.4 days annually and 7 out of 10 women for 3.1 days each year, drops out of the picture when only the eight-day and longer illnesses are considered. Diseases of the pharynx and tonsils, however, again occupied second place. The incidence rate of bronchitis was third from the highest, and of pneumonia (all forms) fourth, in this array. The rates as shown in

Table 2 were as given below. The large number of respiratory cases which cause disability for less than eight days is indicated from a comparison of the rates shown in the table above with those given in the following table:

Relative frequency of different respiratory diseases causing disability for eight consecutive days or longer—Experience of male members of sick-benefit associations which reported their cases to the United States Public Health Service, 1921–1926, inclusive

Respiratory diseases	Annual number of cases per 1,000 men	Per cent of total respiratory cases
All respiratory diseases	43.1	100
1. Influenza and grippe	20.8	48
2. Diseases of the pharynx and tonsils	6.4	15
3. Bronchitis	5.7	13
4. Pneumonia (all forms)	3.3	8
All other respiratory diseases	6.9	16

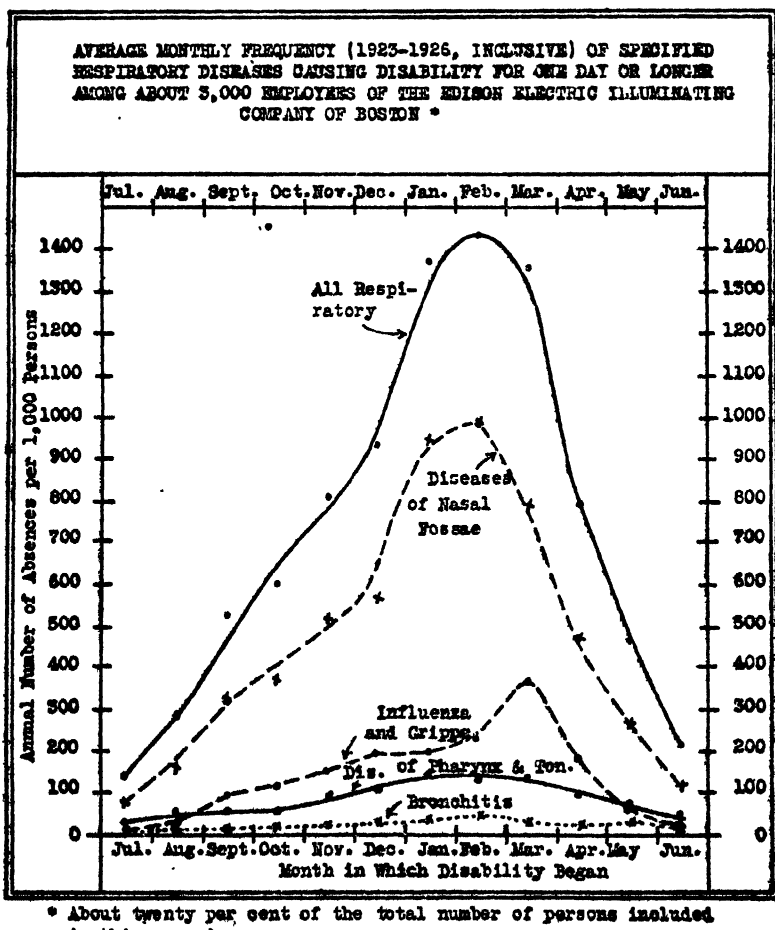
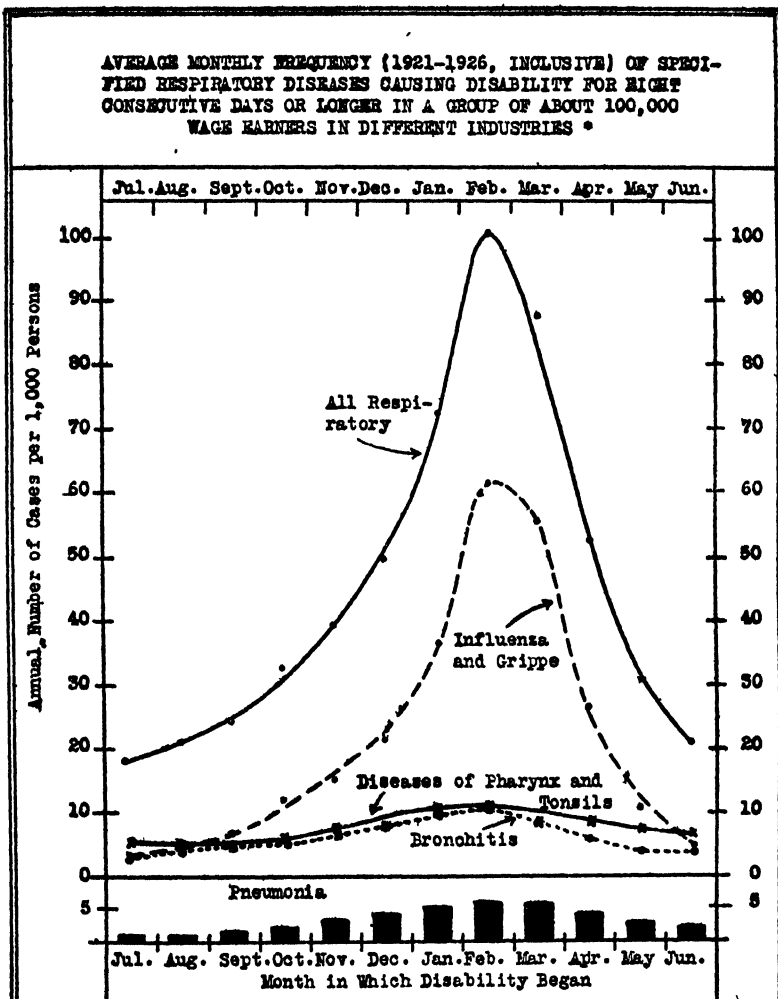


FIG. 1

SEASONAL NATURE OF RESPIRATORY DISEASES

The tendency for respiratory disease incidence to vary in accordance with the season of the year is measured in Tables 3 and 4, and the rates are plotted in Figures 1 and 2. The records for disabilities of one



* About ten per cent of the total number of persons included in the record were women.

FIG 2

day or longer and of eight days or longer both showed the minimum respiratory incidence rate in the month of July and the maximum rate in February.

An interesting difference was revealed in the curve for all respiratory diseases in the two sets of data. Respiratory disabilities lasting

longer than one week occurred oftener in March than in January, and more frequently in April than in December. In contrast, the record for disabilities of one day or longer indicated practically the same respiratory rate in March as in January, and a lower rate in April than in December. Attacks of respiratory sickness having their onset in the late winter and early spring evidently tend to be more prolonged than those which begin in the early part of winter. From this it appears that industrial workers possess less resistance to respiratory infections toward the end of winter than at its beginning.

TABLE 3.—*Average monthly frequency (1923–1926, inclusive) of specified respiratory diseases causing disability for one day or longer among employees (approximately 3,000) of the Edison Electric Illuminating Co. of Boston* [1]

Month in which disability began	Annual number of absences per 1,000 persons							
	Sickness and nonindustrial accidents	Nonrespiratory diseases	Respiratory diseases					
			Total	Colds and other diseases of the nasal fossae	Diseases of the pharynx and tonsils	Influenza and grippe	Bronchitis	Other respiratory diseases [2]
July	842	696	146	80	34	11	4	17
August	985	702	283	165	64	27	13	14
September	1,089	568	521	328	65	95	12	21
October	1,152	555	597	371	59	116	20	31
November	1,423	619	804	520	95	153	18	18
December	1,575	649	926	570	101	194	29	32
January	2,077	713	1,364	947	143	198	27	49
February	2,128	695	1,433	990	129	227	42	45
March	2,059	701	1,358	785	136	367	28	42
April	1,432	641	791	470	98	176	21	26
May	1,093	628	465	273	77	67	26	22
June	937	712	225	122	51	25	10	17

[1] About 20 per cent of the total number of persons included in this table were women
[2] Disease numbers 31, 98, 100–107 in the International List of the Causes of Death, third revision, Paris, 1920.

TABLE 4.—*Average monthly frequency (1921–1926, inclusive) of specified respiratory diseases causing disability for eight consecutive days or longer in a group of about 100,000 wage earners in different industries* [1]

Month in which disability began	Annual number of cases per 1,000 persons							
	Sickness and nonindustrial accidents	Nonrespiratory diseases [2]	Respiratory diseases					
			Total	Influenza and grippe	Diseases of the pharynx and tonsils	Bronchitis, acute and chronic	Pneumonia, all forms	Other respiratory diseases [3]
July	76.8	58.4	18.4	3.7	5.2	3.0	1.0	5.5
August	83.7	62.3	21.4	5.0	5.1	3.9	1.0	6.4
September	83.1	58.6	24.5	6.8	4.8	4.5	1.6	6.8
October	86.5	53.9	32.6	12.0	6.2	5.6	2.2	6.6
November	94.5	54.8	39.7	15.4	7.4	6.3	3.1	7.5
December	103.0	56.4	49.6	21.5	8.1	7.8	4.0	8.2
January	141.6	68.9	72.7	36.3	10.7	9.3	5.0	11.4
February	168.1	67.4	100.7	61.5	11.0	10.9	5.8	11.5
March	150.9	62.9	88.0	55.7	9.0	8.6	5.6	9.1
April	117.0	64.3	52.7	26.5	8.7	5.7	4.0	7.8
May	92.1	61.2	30.9	10.8	7.3	3.9	2.5	6.4
June	80.6	59.6	21.0	4.5	6.3	3.5	1.7	5.0

[1] About 10 per cent of the total number of persons included in this table were women.
[2] Nonindustrial accidents included.
[3] Disease numbers 31, 97, 98, 102–107 in the International List of the Causes of Death, third revision, Paris, 1920.

The tremendous upswing from September to February, and the even more abrupt decline from February to May, in the frequency of diseases of the respiratory system causing absence from work for one day or longer, results largely from the seasonal characteristic of the common cold. There were twelve times as many disabilities from colds and other diseases of the nasal fossæ in midwinter as in midsummer. (See Table 3.)

The seasonal extremes in sickness incidence were not so wide when the more serious respiratory cases only were considered, i. e., those which kept employees away from work for more than one week. The curve for such cases, however, was decidedly steep, largely on account of the marked seasonal tendency in the incidence of the eight-day or longer cases of influenza and grippe. Diseases of the pharynx and tonsils, and bronchitis exhibited no such abrupt rise and decline according to season as was shown for influenza and grippe, and, to a lesser extent, for the pneumonias. (See Table 4 and fig. 2.)

VARIATION IN THE FREQUENCY OF RESPIRATORY DISEASES IN DIFFERENT COMPANIES

The frequency of disability lasting eight days or longer on account of diseases of the respiratory system varied greatly among the 26 industrial sick-benefit associations which reported their claims to the United States Public Health Service throughout the three years ending December 31, 1926. In the establishment showing the lowest respiratory rate for these three years, the incidence was only 17 cases a year per 1,000 men; in the establishment having the highest respiratory rate there were 85 cases a year per 1,000 men. There were thus just five times as many cases of respiratory disease causing disability for a period longer than one week per 1,000 men on the pay roll in the establishment having the most respiratory sickness as in the plant showing the lowest respiratory frequency rate.

TABLE 5.—*Frequency of respiratory diseases causing disability for eight consecutive days or longer among males during the three years ending December 31, 1926, by establishments which reported to the United States Public Health Service throughout this period*

Establishments arrayed according to the size of the respiratory incidence rate	Years of life under observation, 1924–1926, inclusive	Number of respiratory cases	Annual number of respiratory cases per 1,000 men	Establishments arrayed according to the size of the respiratory incidence rate	Years of life under observation, 1924–1926, inclusive	Number of respiratory cases	Annual number of respiratory cases per 1,000 men
Total	317,334	13,616	42.9	No. 13	3,583	162	45.2
				No. 14	5,514	240	43.5
No. 1	15,106	1,284	85.0	No. 15	5,122	219	42.8
No. 2	13,038	1,010	77.5	No. 16	7,829	326	41.6
No. 3	2,156	153	71.0	No. 17	4,257	145	34.1
No. 4	1,610	107	66.5	No. 18	32,000	1,034	32.3
No. 5	13,756	886	64.4	No. 19	9,207	291	31.6
No. 6	6,951	438	63.0	No. 20	10,200	318	31.2
No. 7	6,584	409	62.1	No. 21	45,442	1,372	30.2
No. 8	14,398	838	58.2	No. 22	3,506	105	29.9
No. 9	4,048	233	57.6	No. 23	10,397	293	28.2
No. 10	42,139	2,310	54.8	No. 24	20,802	462	22.2
No. 11	1,409	67	47.6	No. 25	34,259	744	21.7
No. 12	3,371	159	47.2	No. 26	650	11	16.9

Wide differences in death rates as well as in rates of sickness from the respiratory diseases as a whole and from specific diseases of the respiratory system are found in different States, cities, and communities. To cite only one example, the death rate from pneumonia (all forms) in Akron, Ohio, during the 11 years ending December 31, 1920, was 138 per 100,000 population; in Youngstown, which is only 53 miles from Akron, the pneumonia death rate was 268 per 100,000; and in East Youngstown the rate was 484 per 100,000 population during these 11 years

It is evident that the causes of wide differences in the incidence of respiratory diseases and in the severity of such illnesses as measured by the death rate should be investigated and thoroughly understood before any considerable measure of success is to be expected in the prevention or control of these diseases among large groups of the industrial population. In view of the frequency of disability and the amount of time lost from work on account of the respiratory diseases, even a small degree of success in their prevention would contribute enormously to the sum total of physical and mental energy, to the number of days that the industrial population is physically able to work, and, accordingly, to an enhanced national prosperity. It appears that there is not only a field, but an urgent need, for study of the factors which cause such wide variations in the frequency of respiratory diseases among different groups of industrial workers. One such study is being made of a specific respiratory disease. The United States Public Health Service is attempting to measure and evaluate the more important factors affecting the incidence and severity of lobar pneumonia. Records are being kept of the pneumonia cases and the conditions under which they occur in certain groups of industrial employees known to have a high rate, and in other groups experiencing average or less than average pneumonia frequency. Analysis of the records, it is believed, will cast light upon the influence of some of the more important causes of high sickness and death rates from the disease, and contribute something to that knowledge which, obviously, is prerequisite to real control and prevention of the respiratory diseases.

RAT-FLEA SURVEY OF THE PORT OF SAN JUAN, PORTO RICO—A PRELIMINARY REPORT

By O. H. Cox, *Surgeon, United States Public Health Service, Chief Quarantine Officer for Porto Rico;* Arturo L. Carrion, M. D., *Chief Bureau of Plague Prevention, Department of Health of Porto Rico;* and Carroll Fox, *Surgeon, United States Public Health Service*

A rat-flea survey was in progress in the port of San Juan, Porto Rico, during the fiscal year 1927, as a part of a general program of the United States Public Health Service to make rat-flea surveys in the principal seaports of the United States as an aid in estimating their plague infectibility. The survey is still under way and will be continued until sufficient data are secured to substantiate definite conclusions. This paper briefly records the results of the first year's work. Although the total numbers are not very large, the trend appears to be sufficiently definite to warrant publication at this time, and will be followed in time by a full report of the completed survey.

The survey in San Juan is a cooperative effort between the United States Public Health Service Office of Maritime Quarantine for the Island of Porto Rico and the Bureau of Plague Prevention of the Insular Health Department.

METHODS

Specific procedures prescribed for flea surveys in seaports and as used at the New York quarantine station have been closely followed. These are, in general, the methods adopted by Fox and Sullivan of the Public Health Service in their rat-flea surveys in several American seaports (see Public Health Reports, September 11, 1925), and are based upon the experience of Public Health Service officers in plague-eradicative campaigns at San Francisco, New Orleans, and other cities.

Rats, trapped alive in cage traps, were brought to the laboratory without removing them from the traps and without covering the traps. At the laboratory the rats were killed by a blow on the head and each was then suspended over night, separately, in deep glass jars containing some water. In the morning the rats' fur was thoroughly ruffled, or combed within the jar, to dislodge any remaining fleas, and all the fleas from each rat were then collected from the surface of the water and kept in separate groups. Each group of fleas was cleared in potassium hydroxide, passed through water and alcohol to xylol, and finally mounted in balsam on a slide, scattered under a cover glass. Each slide was definitely marked to identify it with its rat host and the location where caught, and the fleas were then identified under the microscope. Sample specimens and doubtful fleas were sent to Surg. Carroll Fox at the New York quaran-

tine station for confirmatory determination. Careful record was kept of the locations where the rats were caught, the numbers of traps set, the species and sex of the rats caught, and the fleas recovered from each rat. Records were also maintained of the variations obtaining in temperature and humidity during the period of the survey.

The city was divided into four zones. Zone I included all docks; Zone II, the water front, including all structures adjacent to the docks; Zone III, the commercial district not on the water front; and Zone IV all other portions of the city. The area of San Juan is extensive in comparison with the population and includes some rather sparsely settled areas, particularly in Zone IV.

It should be stated that the insular government has for several years been trapping rats (in snap traps) for the purpose of lowering the rat population of the city. This has probably tended to decrease the number of live rats caught and to modify their apparent distribution.

While the results reported cover the fiscal year 1927, beginning July 1, 1926, the actual trapping of live rats began July 12, 1926. The numbers for the first month, therefore, are small.

RESULTS

During the fiscal year ended June 30, 1927, there were trapped 360 live rats, from 193 of which were secured 2,575 fleas. Of these fleas, 2,539 were *Xenopsylla cheopis*, 35 were *Echidnophaga gallinacea*, and 1 was *Ctenocephalus canis*. On the basis of these figures we have a total flea index of 7.15 (fleas per rat) and an *X. cheopis* index of 7.05.

For plague-preventive purposes it is almost as important to know where the fleas are as to know how many and what kinds there are. In Table 1 the total flea index of the different zones is given. Since 95 per cent of the fleas are *X. cheopis*, this table very nearly represents the *X. cheopis* index.

TABLE 1.—*Flea index in the various zones*

	Zone I	Zone II	Zone III	Zone IV
Percentage of rats with fleas	85.7	36.3	70 0	25.2
Number of fleas per rat (average)	14.4	2.8	6.2	1.8

It will be at once noted that in Zone I, which includes the docks, the index is much higher than in any other zone, both in percentage of rats with fleas and in numbers of fleas per rat. In this zone was secured the rat with the largest number (124) of fleas, a female Norway, captured at the insular dock. The next highest figures are in Zone III, the commercial district.

The flea index for the different months of the year is set forth in Table 2.

TABLE 2.—*Flea indices for the various months*

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Percentage of rats with fleas	100	60	65	72	93	51	62	52	30	40	48	55
Number of fleas per rat (average)	7	4	8.1	6.3	9	6.2	7.8	5	4.3	5.3	14.4	11

For the year:
Percentage of rats with fleas 54.0
Fleas per rat (average) 7.2

On Chart 1 is plotted the number of fleas per rat and the temperature and humidity curves.

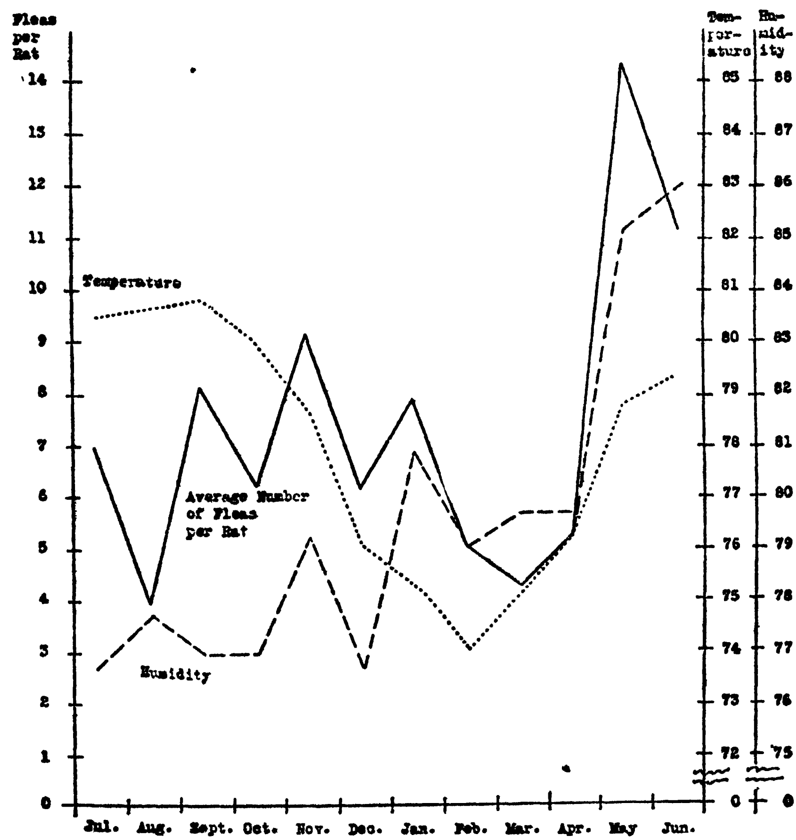


CHART 1.—Graphs showing the average number of fleas found per rat, the temperature, and the humidity in the port of San Juan, Porto Rico, July, 1926–June, 1927

As will be seen, there is no great variation except in May and June. In apportioning the relatively few rats among the different months the numbers become too small to have much meaning. However, the concurrence of a sharp rise in fleas per rat with a similar sharp

rise in humidity and a rise in temperature is probably significant. It agrees with similar observations in many other parts of the world. A study of the temperature and humidity curves reveals, however, that climatic conditions are favorable for the breeding of *X. cheopis* throughout the entire year.

The flea indices for the different species of rat are given in Table 3.

TABLE 3.—*Flea indices for different species of rats*

	Rattus norwegicus [1]	Rattus rattus	Rattus alexandrinus	Totals
Number of rats	287	41	32	360
Number of fleas	2,094	352	129	2,575
Percentage of rats with fleas	48	83	66	53.61
Fleas per rat (average)	7.3	8.6	4	7.15

[1] This rat, the common rat of seaports in the Western Hemisphere, has been given many names, such as the "brown rat," the "Norway rat," "*Mus decumanus*," "*Epimys decumanus*," etc.

It is to be remarked that the total flea index found for the black rat (*Rattus rattus*) is higher than that for the Norway rat. This is not in agreement with observations made in other tropical countries where the total flea index for the Norway rat is usually twice that for the black rat. The *Rattus alexandrinus* is generally regarded as a variety of the *Rattus rattus* and harbors, as a rule, about the same number of fleas. The total number of rats is rather small, which may possibly account for these results.

DISTRIBUTION OF RATS

From Zone I were secured 39 per cent of all the rats. This was due largely to more intensive trapping in this area. Zones IV, II, and III followed, respectively, with 34 per cent, 21 per cent, and 6 per cent.

Records of the numbers of traps set are available only between the dates July 12, 1926, and February 8, 1927. From these records has been compiled Table 4.

TABLE 4.—*Number of rats per 1,000 traps in the various zones*

	Zone I	Zone II	Zone III	Zone IV
Total number of traps set	9,546	1,118	2,286	5,606
Number of rats caught	75	30	13	54
Number of rats per 1,000 traps set	7.9	26.8	5.7	9.6

Zone II is apparently by far the most heavily rat infested, which is surprising in view of the low flea index in this zone.

The Norway rat was found to be markedly predominant. This was to be expected, for two reasons: First, this is the predominant rat

in seaports in the Western Hemisphere; and, second, it is much more easily caught in cage traps than is the black rat or the alexandrian rat, which is notoriously shy of this type of trap. In Chart 2 is shown graphically the apparent concentration of the different varieties in the various zones.

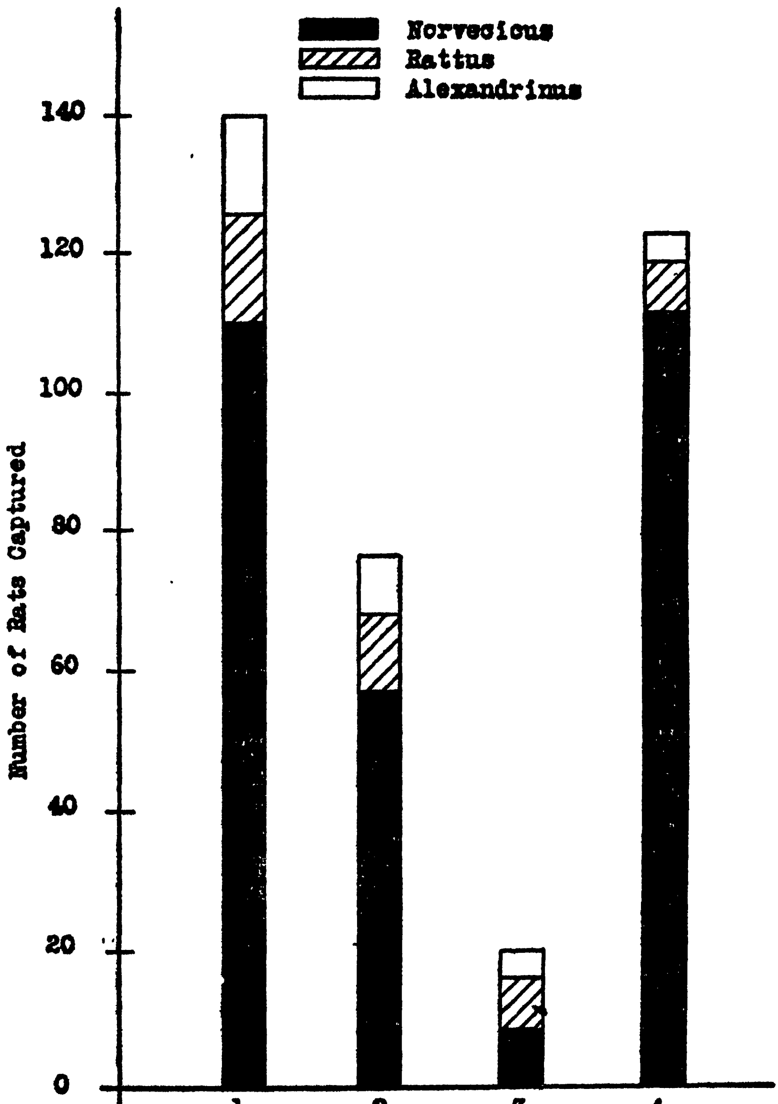


CHART 2.—Graphic representation of relative numbers of rats of different species captured in the different zones in the port of San Juan, Porto Rico, July, 1926–June, 1927

CONCLUSIONS

(1) A rat-flea survey of San Juan, P. R., carried on during the fiscal year 1927, resulted in the capture of 360 live rats, from which were secured 2,575 fleas, 95 per cent of which were *Xenopsylla cheopis*.

(2) On these figures a total rat-flea index of 7.15 is indicated, and an *X. cheopis* index of 7.05.

(3) The total flea index on the docks is much higher than elsewhere in the city, the commercial district being next, then the water front, and last all other portions of the city. The respective figures are 14.4, 6.2, 2.8, and 1.8.

(4) Temperature and humidity conditions are favorable for flea breeding throughout the year. There was a marked rise of the index in May and June, coincident with a similar rise in humidity and a rise of temperature.

(5) *Rattus norvegicus* is the predominant rat.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Phosphorus poisoning held not compensable under workmen's compensation act.—(Virginia Supreme Court of Appeals; Turner *v.* Virginia Fireworks Co. et al., 141 S. E. 142; decided January 19, 1928.) An employee of a fireworks company sought compensation for phosphorus poisoning contracted in the course of her employment. The State industrial commission found that it was her duty to handle white phosphorus, and that, in rubbing an aching tooth with her fingers, she conveyed the poison to her mouth. The workmen's compensation statute provided:

"Injury" and "personal injury" shall mean only injury by accident arising out of and in the course of the employment and shall not include a disease in any form, except where it results naturally and unavoidably from the accident.

Compensation was denied by the commission on the ground that the claimant had not sustained an accident within the meaning of the compensation law. On appeal the supreme court of appeals upheld the action of the commission, stating as follows in the opinion:

* * * Whether or not the rubbing of the aching tooth with her fingers and getting poison in her mouth was an accident, within the meaning of the workmen's compensation act, we deem it unnecessary to decide. If it be admitted that it was an accident, it does not follow that the phosphorus poison from which she suffered was the natural and unavoidable result of the accident. The diseased tooth was exposed to phosphorus fumes before she rubbed it, and it is equally probable that the poison resulted from the phosphorus fumes to which it was exposed rather than the rubbing of the tooth * * *.

If claimant's injuries were the natural and unavoidable result of an accident, she should be allowed compensation, but if they resulted from an occupational

disease, without an accident, there can be no recovery. Since the disease may have resulted from either of the two causes, for one of which the employer is liable and for the other of which he is not liable, the burden was on the claimant to show that the injuries resulted from the former.

* * * * * * *

There being no proof that the injury to the claimant resulted naturally and unavoidably from the rubbing of the phosphorus upon her tooth, the judgment of the commission will be affirmed.

Convictions for taking clams from proscribed area upheld.—(Massachusetts Supreme Judicial Court; Commonwealth *v.* St. John, and six other cases, 159 N. E. 599; decided January 5, 1928.) Several persons were found guilty of taking clams illegally from certain tidal waters and flats which had been examined by the State department of public health, acting under a State law, and determined to be contaminated, and also were found guilty of possessing clams so taken. One of the defendants was also convicted of transporting clams so taken. On appeal, the supreme court overruled the exceptions of the defendants and sustained the convictions.

Attempt of venereally-infected husband to force wife to have sexual intercourse held extreme cruelty.—(New Jersey Court of Chancery; Lazarwitz *v.* Lazarwitz, 139 A. 881; decided January 13, 1928.) In a divorce proceeding it was held that the attempt of a husband, who, to his own knowledge, was suffering from syphilis, the Wassermann test resulting in a four plus report, to force his wife to have sexual intercourse with him against her will constituted extreme cruelty under the terms of an act authorizing divorce from the bonds of matrimony for extreme cruelty.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Sewerage Systems, with Special Reference to Run-Off of Surface Waters. M. H. Limb. *The Surveyor*, vol. 72, No. 1872, December 9, 1927, pp. 567–570. (Abstract by H. W. Streeter.)

A concise résumé of present-day practice in the design of sewerage systems, as based on British experience. A general description is given of the types of sewerage systems, materials of construction, and methods of determining the flow of domestic sewage, trades wastes, and storm water. The remainder of the paper is devoted to describing, with illustrative examples, methods of determining maximum storm-water flows and times of concentration at specified points. The description is illustrated by charts and sketches showing typical layouts; a particularly useful diagram being one (fig. 4) showing the relation between rainfall intensity and time of concentration. The various formulæ for this relation are discussed and practical methods, both analytical and graphical, for applying these formulæ to the design of storm-water sewers are described. The author notes that so many variable factors are involved in each problem that it is impossible to reduce the subject to the mathematical precision possible with other engineering subjects.

Digestion of Sewage Screenings. H. Heukelekian. *Public Works*, vol, 58, No. 12, December, 1927, pp. 455–457. (Abstract by A. S. Bedell.)

The digestion of screenings from a fine screen, seeded with ripe sludge, was tried out with and without fresh solids. "Fresh solids" is material collected by sinking pails in flow chamber of an Imhoff tank, thus securing settled solids of the screened sewage. Lime was added to a duplicate series to adjust and maintain the reaction to a pH value of 7.4. To a 2:1 mixture of fresh solids and ripe sludge 11.2 per cent screenings were added on the basis of volatile matter. The mixture of screenings and ripe sludge had a ratio of 1:1 on the basis of volatile matter. Frequent gas measurements and occasional gas analyses were made. Solids and ash were determined in the beginning and at the end.

The results indicate that the digestion of screenings, either separately or in conjunction with fresh solids, is feasible. The rate of digestion of screenings was as rapid as that of the screened fresh solids. The volume of gas produced from screenings was as high as that from fresh solids. About equal amounts of lime were necessary for the digestion of screenings and of fresh solids. In general, the effects of liming were practically negligible.

Paper Wastes: Investigation of the Recirculation and Treatment of Waste Waters from the Process of Paper Making. I. R. Riker. *Public Health News*, New Jersey State Department of Health, vol. 12, No. 10–11, September–October, 1927, pp. 290–303. (Abstract by G. H. Hazlehurst.)

Pollution of streams in New Jersey by paper-mill wastes has been a serious problem for the past decade. No type treatment in the State has been entirely successful. Mill owners objected to the recirculation and reuse of water (closed system), because water soured and slime was produced, hindering the process of paper making.

The mill investigated and reported on had four paper-making machines. All waste white water was being reused. Two recirculating systems were operated. One used chemical precipitation of wastes, and this water was used for felt showers with make-up waste rates of 3 to 1. The other system returned waste white water direct from pits to breakers or beaters. Chemical precipitation plant handles all water over and above that used by breakers or beaters. "Boothall," a balanced coagulant, is used. Reclaimed stock from precipitation plant makes up 20 per cent of the material used by No. 1 machine; that is, 15 tons of finished material is procured from 12 tons of old newspaper stock (raw material).

After the investigation was made it was reported that all waste white water was being used and that for long periods it was unnecessary to pollute the creek with this waste.

The Development of Tanks for the Bacterial Treatment of Sewage. A. C. Hewitt. *The Commonwealth Engineer*, vol. 15, No. 4, November 1, 1927, pp. 157–158. (Abstract by E. C. Sullivan.)

This article outlines the development of the Cameron tank in 1895, the Travis tank in 1903, and the Imhoff tank in 1907. The particular advantages or claims made for these various types of tanks are given, as well as the principles involved in their designs.

The development of the activated sludge process is also traced. Mention is made of research conducted during the past four years to obtain information about various points as follows: (*a*) Deciding what preliminary treatment, if any, should be given to the sewage before aeration; (*b*) endeavoring to reduce operation costs by perfecting the method of aeration; (*c*) ascertaining the best method of treating the large amount of sludge which results from activation.

Details of studies on these particular points are given, including the addition of an activated sludge plant to the existing Imhoff tank plant at Essen, Germany, and the digestion of excess sludge in the Imhoff tanks; the use of mechanical

agitators at Sheffield, England, to obtain oxygen from the air; and of the measures taken for the conditioning of sludge at Chicago, Ill., Milwaukee, Wis., and Houston, Tex.

Annual Report, Department of Health, Government of Palestine, 1926. 92 pages. (Abstract by I. W. Mendelsohn.)

Typhoid fever.—Epidemics occurred in Emek Jezriel, Tel Aviv, and Jerusalem, with 206, 223, and 280 cases, respectively. The total incidence for the country was 1,402, as compared with 705 in 1925.

There was no evidence to incriminate water as the definite cause, nor could the outbreaks be attributed to milk or other foods, though in some towns the sale of vegetables fertilized with sewage constituted a constant possible means of spreading infection. Infection from carriers and by contact from cases was regarded as an important factor assisted by late notification, delayed hospitalization of cases, and overcrowding in insanitary quarters of towns and in new settlements.

Malaria control.—The decrease in malaria incidence in the country has continued. At the end of the year, 21,000 of the 60,000 possible breeding places on record in towns had been permanently mosquito-proofed, while over 12,000 (or a total of 23,000) such places in the villages had been dealt with. Seven thousand and thirty nine pumps had been fitted to cisterns. Oil and Paris green were used in control measures.

The 12 demonstration areas controlled by the malaria research unit were the same as in 1925, the methods of control consisting of hand collection or "smoking" out of mosquitoes in January and February, before the breeding season started; examination of potential larval breeding places at the end of March after the heavy rains; and institution of antilarval measures (Paris green or oil) and minor drainage and clearance work. In some regions mosquito flights of 6 kilometers, with *A. elutus* as the mosquito, are mentioned.

Usually there is a rise of benign tertian malaria in June and July and then a decline, and a marked rise of malignant tertian malaria in October and November. In 1926 the amount of benign tertian malaria was less than usual in June and July, but instead of decreasing subsequently it increased steadily until it reached its maximum in November. The difference in malaria incidence between 1925 and 1926 is ascribed to abnormally heavy breeding in uncontrolled areas during 1926 and to an influx of mosquitoes from these areas into the controlled areas.

Water supplies.—Due to deficient supply of pure water in Jerusalem, contaminated surface supplies were resorted to after chlorination. The supply of water varied from 50,000 to 230,000 gallons per day. A large number of villages improved their water supplies.

Sanitary engineer's section.—The activities of this section included supervision of plans of sanitary arrangements of Government buildings; new public establishments; drainage, sewage disposal, water supply, and malaria-control works; and house sanitation and plumbing. This section acts in an advisory capacity to all municipal authorities; maintains supervision over sanitary services, submitting recommendations regarding financial provisions for these services; specifies the technical requirements in matters affecting water supply, house drainage, sewerage and town planning; and controls conditions for licensing food and drink establishments.

Sewage disposal.—Tests made on raw sewage from Jerusalem subjected to a few hours, sedimentation indicated that the addition of not less than 30 p. p. m. of chlorine in the form of bleaching powder would deodorize the sewage, which had the following composition in p. p. m.: Free ammonia, 650; albuminoid am-

monia, 140; total organic nitrogen, 210; oxygen absorbed (3 hours at 37° C.), 1,010; chlorine, 2,120; suspended matter, 4,850.

Ventilation Experiments in the Moffat Tunnel. G. E. McElroy and C. A. Betts. *Engineering News-Record*, vol. 99, No. 24, December 15, 1927, pp. 956–959. (Abstract by Leonard Greenburg.)

The Moffat tunnel pierces the Continental Divide in Colorado. Prior to the completion of this tunnel it was found necessary to prepare specifications for the fans and ventilating equipment necessary so that the tunnel might be used by steam locomotives. The tunnel is single track, approximately 32,250 feet in length, and has an average cross section of 400 square feet. One-half of the tunnel will be provided with heavy timber or steel lining while the remaining half is of rock construction.

In order to determine the requirements for mechanical ventilation it was necessary to estimate the volume of flow and the necessary pressure in order to circulate this quantity of air through the tunnel. The primary purpose of the ventilation is to dilute and remove the noxious gases produced by coal in the locomotives, and the second purpose is to reduce the high temperatures which would ordinarily be found in the locomotive engine cab. It was estimated that the maximum quality of air required for dilution to 5 parts of carbon monoxide per 10,000 of air would be approximately 360,000 cubic feet per minute.

To determine the pressure required to force the air through the tunnel way, tests were conducted to determine the friction factor, and this was found to average 0.0000000005. The resistance of the clear tunnel was calculated to be 5.03 inches of water and, likewise, the resistance of the fan connection was found to be 0.02 inch of water, and for a train moving at a speed of 10 miles per hour against the flow, the resistance was found to be 1.31 inches of water, yielding a total of 6.36 inches of pressure required.

Due to the difference in elevation between the two ends of the tunnel the barometric pressures are not the same, and it was determined that there would be a strong draft of air from west to east during the winter season and a variable and reversing draft during the remainder of the year. Natural draft pressures play an important part in this problem and increase the maximum demand on the ventilation equipment, since during the winter season the fan must act against strong adverse natural draft. Experimental determinations of friction factors in the uncompleted tunnel were made in order to estimate the tunnel resistance. Interferences were frequent, because tunneling operations were still in progress. For this reason but 20 per cent of the observations escaped interference.

The determination of friction factors involves the simultaneous measurement of air flow and the difference in static pressure between the two ends of the section under test. The air velocity measurements were made with calibrated anemometers. Static pressure observations were made by means of the Bureau of Mines static tube with a Wahlen gauge. Good agreement of average results was secured and the average value of the factor was found to be 0.000000007 for velocities ranging from 57 to 80 feet a minute in the rock section of the tunnel. In the timbered section the average friction factor was found to be 0.0000000053. In a second timbered section of the Pioneer tunnel (a separate portion of the Moffat tunnel) tests of air velocities of from 250 to 700 feet a minute gave a friction factor of 0.0000000052, and at 171 feet a minute the factor was found to be 0.0000000073.

The authors point out that more data are needed on the interrelated effects of area, low velocity flow, and timber spacing as related to friction factors.

Development of Water Treatment at Indianapolis. Harry E. Jordan. *Engineering News-Record*, vol. 99, No. 19, November 10, 1927, pp. 762–764. (Abstract by D. E. Kepner.)

In 1872, when the Indianapolis Water Co. began operation, the public water supply of Indianapolis was derived from infiltration wells and galleries. This supply was later augmented by deep wells.

In 1902, three slow sand filters of 1.6 acres each, uncovered, were constructed. In 1905, central dividing walls were constructed in these, making 6 filters of 0.776 acre each, and they were then covered with flat slab roofs. The capacity of this plant was 11.7 m. g. d. following the reconstruction, but was increased to 20 m. g. d. by the addition of preliminary settling basins and by improved operation. With prechlorination this plant is now operated at the rate of 6.2 m. g. d. per acre.

In 1925, construction was started on a new rapid sand filter plant, comprising six 2 m. g. d. units with a twin coagulation basin of 6-hour total retention capacity. It has several new and interesting features, including two separate perforated pipe collecting systems for each filter unit, hydrometer and orifice-controlled alum solution application, very complete operating tables with baked enamel panels, slate tops, filtered water turbidity indicators, etc.

The filtered water turbidity, averaging 0.17 p. p. m. and never exceeding 0.3 p. p. m., and other operating results of the new plant are very gratifying.

The Problem of Rural Water Supplies. James J. Paterson. *The Journal of State Medicine*, vol. 35, No. 9, September, 1927, pp. 535–540. (Abstract by L. M. Fisher.)

The Public Health (Water) Act of 1878 provides that rural sanitary authorities shall require a sufficient water supply for every occupied dwelling; shall keep houses not so supplied from being occupied; and shall make periodical inspections. The cost of providing such a supply shall not exceed a capital sum the interest on which at 5 per cent per annum exceeds 3 pence per week. No standards of purity or adequacy can be set. Local health authorities may require cesspools to meet certain requirements, but have no authority over wells.

Private water companies are given exclusive rights in certain areas, but can not be made to supply everybody in the area if it is not profitable.

The remedy suggested is a rural water board with adequate powers, such as the Metropolitan Water Board or the Thames Conservancy Board, which have jurisdiction over the entire watersheds.

Rural Water Supplies—The Advantages of Decentralization. D. T. Worger. *The Surveyor*, vol. 72, No. 1870, November 25, 1927, pp. 513–514. (Abstract by C. C. Ruchhoft.)

The Bruston patent autopneumatic water supply system, which, briefly, consists of an automatically controlled gas engine or electric motor and a pressure tank, is recommended in decentralized units for use in rural districts where the expense of a centralized water supply system is prohibitive. The advantages of such a system are illustrated in the case of a rural district which contained 25 small parishes varying in population from less than 100 to 1,000 and having a total population of 8,439. This district may be divided into four groups of villages, two groups to be served by one pumping station and the other two groups to be served by one pumping station each. Comparison of costs for such a decentralization system for the above district with a centralized system was favorable toward the decentralized system.

Refuse Disposal in England. Anon. *Public Works*, vol. 58, No. 12, December, 1927, pp. 453–454. (Abstract by A. S. Bedell.)

This article is a summary of a section of the 1925–26 report of the Ministry of Health of England. It is pointed out that the returns from the questionnaire

are not entirely satisfactory, owing to differences in methods of accounting and in misinterpretation of the questions.

The returns from 79 towns, representing a population of 12,600,000, are tabulated in the report. Mixed collection of garbage, ashes, and rubbish is practiced in England and the average quantity collected for all towns was 1.66 pounds per capita per day, or 606 pounds per year. The average net expenditure, including depreciation and renewal charges, per ton for collection was $2.27; for disposal $1.06, or the cost per capita per annum was 65 cents for collection and 28 cents for disposal.

As to the method of disposal, 15 of the municipalities used incineration alone, and 42 incineration combined with one of the other methods. Fourteen used dumping on land alone and 34 used dumping in combination with some other method. Five used dumping at sea alone, and 3 in combination with some other method. Twelve used separation in combination with some other method, and 8 used pulverization combined with some other method. One reported land reclamation in connection with incineration and dumping. Average costs, including depreciation and renewals, were: Dumping at sea $2.24, ranging from $1.70 to $2.72; dumping on land $2.30, ranging from $1.06 to $3.85; incineration $3.70, ranging from $2.33 to $5.58.

Cleansing. W. Weaver. *The Surveyor*, vol. 72, No. 1872, December 9, 1927, p. 579. (Abstract by H. W. Streeter.)

The causes of present high yield of house refuse are: (a) Thriftlessness; (b) poor design of ranges and fire grates in older houses; (c) waste of coal fuels, where coal is cheap or of low grade; (d) inclusion, in some instances, of excrement with refuse; (e) seasonal variation in amount produced; (f) climatic conditions influencing yield of refuse. The quantity of house refuse varies greatly, but averages about 18 hundredweight per day per 1,000 people. If suitable precautions were taken in homes, 40 per cent of the refuse would be preventable, effecting a saving, in Great Britain, of 20,000,000 pounds.

Measures for increasing the amount of home destruction of refuse are discussed, including (a) installation of double bins as public property, with separation of combustible from noncombustible portions at home, and (b) payment of a bonus to householders attaining a prescribed standard. Methods for dealing with seasonable variations in refuse also are suggested.

The Treatment of Municipal Offal by Fermentation in Closed Cells. Jean Bordas. *Ann. d'hyg publ. industr. et soc.*, vol. 5, No. 3, 1927, pp. 142–150. Translation of an abstract by Kamman in *Zentralblatt fur die gesamte Hygiene*, vol. 15, No. 11 12, August 10, 1927, pp. 496–497. (Tr. by J. K. Hoskins.)

The Beccari system is used in many Italian cities, Florence, Naples, Bologna, Carrara, Novarra, for treating stable manure. The plant consists of closed chambers of about 5 cubic meters capacity, in which the manure undergoes fermentation for about 60 days. Of the evolved gases, ammonia, being the greatest, is recovered in absorption towers by means of iron sulphate and phosphate of lime. The temperature rises to from 70° to 75° C., by this method of fermentation. Nitrogen losses are also reduced to a minimum. Similar treatment of municipal organic wastes requires only 40 days. A disadvantage of treating this latter material in this way is that approximately 50 per cent of it is not fermentable.

DEATHS DURING WEEK ENDED MARCH 3, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended March 3, 1928, and corresponding week of 1927. (From the Weekly Health Index, March 8, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Mar. 3, 1928	Corresponding week, 1927
Policies in force	70, 380, 930	66, 911, 607
Number of death claims	15, 679	13, 415
Death claims per 1,000 policies in force, annual rate	11. 6	10. 5

Deaths from all causes in certain large cities of the United States during the week ended March 3, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, March 8, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Mar. 3, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 3, 1928 [2]
	Total deaths	Death rate [1]		Week ended Mar. 3, 1928	Corresponding week 1927	
Total (68 cities)	8, 387	14. 5	13. 7	900	871	[3] 74
Akron	37			8	3	87
Albany [4]	35	15. 2	16. 1	2	3	41
Atlanta	94	19. 3	18. 8	10	12	
White	18		14. 0	6	5	
Colored	46	([5])	30. 3	4	7	
Baltimore [4]	273	17. 2	17. 6	21	26	67
White	212		15. 2	19	14	76
Colored	61	([5])	31. 6	2	12	31
Birmingham	78	18. 3	14. 4	13	7	111
White	46		9. 4	6	1	83
Colored	32	([5])	22. 2	7	6	158
Boston	260	17. 0	14. 5	35	27	97
Bridgeport	28			6	4	110
Buffalo	166	15. 6	14. 3	18	20	77
Cambridge	31	12. 9	16. 8	4	7	71
Camden	34	13. 1	13. 3	4	8	64
Canton	23	10. 8	13. 8	2	6	48
Chicago [4]	830	13. 8	12. 6	84	92	72
Cincinnati	152	19. 2	15. 7	21	10	127
Cleveland	210	10. 9	10. 8	28	34	76
Columbus	86	15. 1	15. 2	7	5	65
Dallas	56	13. 5	11. 1	8	6	
White	46		10. 8	6	5	
Colored	10	([5])	13. 3	2	1	
Denver	93	16. 5	17. 8	10	6	
Des Moines	37	12. 7	7. 4	1	2	17
Detroit	320	12. 1	12. 3	54	61	83
Duluth	19	8. 5	7. 3	2	2	47
El Paso	48	21. 3	18. 4	7	4	
Erie	21			3	2	68
Fall River [4]	32	12. 5	13. 4	4	2	60
Flint	34	11. 9	13. 9	5	7	64
Fort Worth	38	11. 8	10. 5	2	1	
White	25		10. 5	1	1	
Colored	13	([5])	10. 6	1	0	
Grand Rapids	39	12. 4	10. 3	3	4	46
Houston	56			5	8	
White	33			4	5	
Colored	23	([5])		1	3	
Indianapolis	105	14. 4	13. 7	7	5	53
White	88		13. 5	3	4	26
Colored	17	([5])	15. 1	4	1	243
Jersey City	80	12. 9	13. 1	10	11	75
Kansas City, Kans	29	12. 8	11. 1	1	3	21
White	20		9. 2	0	0	0
Colored	9	([5])	19. 7	1	3	145
Kansas City, Mo	115	15. 4	13. 2	12	8	85

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended March 3, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, March 8, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Mar. 3, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 3, 1928
	Total deaths	Death rate		Week ended Mar. 3, 1928	Corresponding week 1927	
Knoxville	32	15.9	12.3	4	2	87
White	21		10.4	3	1	73
Colored	11	(5)	25.6	1	1	213
Los Angeles	251			21	23	60
Lowell	23	10.9	15.1	1	5	21
Lynn	26	12.9	9.5	1	2	25
Memphis	68	18.7	21.0	4	5	47
White	33		14.9	2	3	37
Colored	35	(5)	32.1	2	2	63
Milwaukee	103	9.9	11.9	20	13	89
Minneapolis	88	10.1	13.2	8	7	48
Nashville	55	20.7	19.3	6	4	94
White	34		19.0	3	2	64
Colored	21	(5)	20.1	3	2	180
New Bedford	26	11.4	10.0	1	7	22
New Haven	48	13.4	11.3	6	2	85
New Orleans	166	20.2	20.8	10	18	48
White	93		15.4	5	7	36
Colored	73	(5)	35.9	5	11	73
New York	1,692	14.7	13.2	185	187	75
Bronx Borough	231	12.7	10.9	20	17	60
Brooklyn Borough	577	13.1	11.2	73	65	73
Manhattan Borough	649	19.4	18.6	73	76	87
Queens Borough	189	11.6	9.4	18	24	72
Richmond Borough	46	16.0	14.9	1	5	18
Newark, N. J	123	13.6	11.1	20	10	103
Oakland	76	14.5	11.3	5	5	54
Oklahoma City	24			2	4	
Omaha	53	12.4	15.5	5	3	58
Paterson	49	17.7	17.4	4	4	69
Philadelphia	605	15.3	13.4	64	60	86
Pittsburgh	180	14.0	15.8	25	29	82
Portland, Oreg	79			2	0	21
Providence	78	14.2	14.5	8	14	70
Richmond	63	16.9	12.5	4	4	52
White	34		9.6	3	2	61
Colored	29	(5)	19.7	1	2	37
Rochester	84	13.4	11.6	5	9	41
St. Louis	292	18.0	14.6	19	15	64
St. Paul	48	10.0	14.2	3	5	29
Salt Lake City [4]	37	14.0	17.3	8	3	181
San Antonio	116	27.8	16.8	15	11	
San Diego	47	20.5	14.9	2	2	38
San Francisco	153	13.7	15.3	6	9	38
Schenectady	27	15.1	8.4	2	1	63
Seattle	78	10.6	9.9	4	1	41
Somerville	23	11.7	8.2	3	0	104
Spokane	43	20.6	12.9	0	3	0
Springfield, Mass	37	12.9	13.1	6	0	95
Syracuse	63	16.5	13.8	7	6	85
Tacoma	26	12.3	12.6	3	0	77
Toledo	88	14.7	14.9	15	9	144
Trenton	35	13.2	16.0	9	6	153
Utica	36	18.1	17.6	3	4	68
Washington, D. C	144	13.0	17.9	14	6	80
White	99		14.1	7	2	58
Colored	45	(5)	29.1	7	4	129
Waterbury	17			2	4	58
Wilmington, Del	21	8.5	11.1	1	1	26
Worcester	56	14.8	17.1	10	6	121
Yonkers	33	14.2	12.7	6	5	137
Youngstown	29	8.7	13.2	3	9	40

[1] Annual rate per 1,000 population.

[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.

[3] Data for 68 cities.

Deaths for week ended Friday, Mar. 2, 1928.

[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, [illegible]5; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended March 12, 1927, and March 10, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 12, 1927, and March 10, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928
New England States:								
Maine	1	10	15	10	213	58	0	0
New Hampshire		3		9		17		0
Vermont		1			47	47	0	0
Massachusetts	98	90	19	8	238	1,055	2	2
Rhode Island	8	10	1		2	69	1	0
Connecticut	37	23	27	175	77	377	0	0
Middle Atlantic States:								
New York	407	354	[1] 87	[1] 49	670	1,910	4	18
New Jersey	92	124	42	22	67	996	3	1
Pennsylvania	163	184			852	924	1	3
East North Central States:								
Ohio		70		39		934		1
Indiana	47	31	41	21	243	175	1	0
Illinois	123	154	63	51	2,539	149	4	13
Michigan	90	70		6	314	780	0	1
Wisconsin	34	30	76	104	584	120	7	5
West North Central States:								
Minnesota	30	12	5	2	173	41	1	1
Iowa [2]	28	10			787	36	1	1
Missouri	46	56	3	86	244	239	1	6
North Dakota	4	3		3	216	4	2	2
South Dakota	1		4	2	141	20	0	0
Nebraska	7	10	1	14	416	8	0	1
Kansas	10	14	13	47	938	48	0	7
South Atlantic States:								
Delaware	2	2			9	10	0	0
Maryland [2]	43	44	455	51	54	951	0	1
District of Columbia	24		18		7		0	
Virginia								
West Virginia	12	17	69	18	228	197	0	0
North Carolina	22	36			386	3,662	0	0
South Carolina	11	22	1,352	1,194	95	1,256	0	0
Georgia	15	16	374	128	162	236	2	0
Florida	35	7	68	25	134	32	0	0

[1] New York City only. [2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 12, 1927, and March 10, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928
East South Central States:								
Kentucky		15				128		0
Tennessee	9	20	264	170	173	338	0	1
Alabama	39	16	133	282	107	369	2	2
Mississippi	8	13						1
West South Central States:								
Arkansas	5	2	93	570	75	539	1	0
Louisiana	21	33	24	157	164	315	2	1
Oklahoma [3]	19	37	157	283	263	395	0	1
Texas	41	45	329	685	133	439	0	1
Mountain States:								
Montana	5				42		8	
Idaho	6	1			61		0	2
Wyoming	1				41	110	0	2
Colorado	11	10	1	1	402	41	1	10
New Mexico	3	9	3	8	32	121	0	0
Arizona	1	7		1	130	17	0	6
Utah [1]	6	3	8	2	166	4	2	1
Pacific States:								
Washington	14	22	1		282	308	6	4
Oregon	18	17	210	32	119	24	1	4
California	127	127	86	48	3,735	284	2	5

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928
New England States:								
Maine	0	2	26	40	0	0	2	2
New Hampshire		0		10		0		0
Vermont	0	0	4	13	0	0	0	0
Massachusetts	1	1	559	329	0	0	9	2
Rhode Island	1	0	30	38	0	0	0	0
Connecticut	0	0	109	71	0	4	0	1
Middle Atlantic States:								
New York	2	5	1,286	804	15	13	27	17
New Jersey	0	0	379	285	0	0	6	4
Pennsylvania	0	0	643	513	0	0	10	6
East North Central States:								
Ohio		0		272		24		3
Indiana	0	1	265	144	150	79	1	5
Illinois	0	3	348	409	29	47	11	4
Michigan	0	0	391	284	46	37	14	5
Wisconsin	0	0	173	245	5	42	4	5
West North Central States:								
Minnesota	1	0	261	173	2	1	5	5
Iowa [1]	0	0	120	88	16	68	1	4
Missouri	0	1	155	161	28	53	6	3
North Dakota	2	1	54	73	1	0	1	0
South Dakota	0	0	71	42	9	10	1	1
Nebraska	0	2	85	126	20	51	2	0
Kansas	1	1	196	149	58	70	1	0
South Atlantic States:								
Delaware	0	0	18	11	0	0	0	0
Maryland [1]	0	0	64	70	0	4	4	2
District of Columbia	0		14		0		0	
Virginia	0				2			
West Virginia	0	1	47	54	34	76	15	8
North Carolina	0	0	46	39	54	93	4	4
South Carolina	2	1	13	5	37	14	2	0
Georgia	0	0	23	19	73	15	5	1
Florida	1	1	29	7	32	7	17	1
East South Central States:								
Kentucky		0		54		32		3
Tennessee	0	0	60	82	11	26	6	4
Alabama	0	0	21	16	46	12	16	4
Mississippi	0	0	10	21	7	4	5	3

[1] Week ended Friday.

[3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 12, 1927, and March 10, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928	Week ended Mar. 12, 1927	Week ended Mar. 10, 1928
West South Central States:								
Arkansas	0	0	15	30	4	7	10	4
Louisiana	1	0	19	10	17	32	12	6
Oklahoma [2]	0	1	71	59	47	181	20	5
Texas	0	0	64	134	62	65	3	3
Mountain States:								
Montana	0	------	93	------	8	------	1	------
Idaho	0	0	17	9	5	0	0	0
Wyoming	0	0	25	30	4	15	0	0
Colorado	0	1	107	130	2	12	1	1
New Mexico	0	0	7	25	11	2	0	1
Arizona	0	0	57	11	0	25	0	0
Utah [1]	0	0	9	6	2	13	0	0
Pacific States:								
Washington	0	1	82	62	70	79	1	1
Oregon	0	2	58	23	37	64	2	4
California	0	6	246	185	17	19	3	6

[1] Week ended Friday.
[2] Exclusive of Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January, 1928										
Kansas	13	100	25	------	110	------	3	775	470	5
South Carolina	------	135	5,356	566	4,075	115	13	67	76	31
South Dakota	------	9	19	------	138	------	1	294	67	1
Virginia	6	194	3,185	41	1,756	8	1	281	34	37
February, 1928										
Arizona	14	42	5	------	40	------	0	25	101	2
Connecticut	4	138	32	------	1,267	------	1	378	16	7
Nebraska	8	61	13	2	16	------	3	391	132	7

January, 1928

	Cases
Chicken pox:	
Kansas	893
South Carolina	248
South Dakota	70
Virginia	628
Conjunctivitis:	
Kansas	3
Dengue:	
South Carolina	10
Dysentery:	
Virginia	60
German measles:	
Kansas	13
Hookworm disease:	
South Carolina	98
Virginia	2
Mumps:	
Kansas	207
South Carolina	8
South Dakota	97
Ophthalmia neonatorum:	
South Carolina	20
Paratyphoid fever:	
South Carolina	3
Pink eye:	
Kansas	7
Rabies in animals:	
South Carolina	15
Scabies:	
Kansas	
Septic sore throat:	
Kansas	
Tetanus:	
Kansas	
Trachoma:	
South Dakota	1
Tularæmia:	
Kansas	1
Whooping cough:	
Kansas	431
South Carolina	244
South Dakota	39
Virginia	469

February, 1928

	Cases
Chicken pox:	
Arizona	82
Connecticut	404
Nebraska	343
Favus:	
Connecticut	2
German measles:	
Arizona	2
Connecticut	9
Nebraska	3
Lethargic encephalitis	
Connecticut	5
Mumps:	
Arizona	44
Connecticut	541
Nebraska	275
Ophthalmia neonatorum:	
Connecticut	1
Paratyphoid fever:	
Connecticut	5
Rabies in animals:	
Connecticut	6
Septic sore throat:	
Connecticut	6
Nebraska	9
Trachoma:	
Arizona	15
Whooping cough:	
Arizona	19
Connecticut	642
Nebraska	75

PLAGUE IN SANTA CRUZ COUNTY, CALIF.

A case of bubonic plague occurred at Santa Cruz, Santa Cruz County, Calif., January 23, 1928. The case was reported as suspected tularaemia by the attending physician, diagnosed clinically as plague, and diagnosis confirmed by bacteriological examinations, February 7 and 8, 1928.

Steps are being taken for intensive rodent-control work, including squirrel and rat extermination in the vicinity of Santa Cruz. The plague-control measures contemplate a 5-mile rodent-free zone.

The last case of human plague in Santa Cruz County occurred in July, 1922, and plague has not been reported in rodents from that county since September 27, 1922.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 101 cities reporting cases used in the following table are situated n all parts of the country, and have an estimated aggregate population of more than 31,650,000. The estimated population of the 95 ities reporting deaths is more than 30,960,000. The estimated exectancy is based on the experience of the last nine years, excluding pidemics.

Weeks ended February 25, 1928, and February 26, 1927

	1928	1927	Estimated expectancy
Cases reported			
iphtheria:			
43 States	1,826	1,777	
101 cities	1,055	1,068	964
easles			
42 States	16,184	14,480	
101 cities	6,010	5,133	
liomyelitis.			
43 States	35	19	
arlet fever:			
43 States	4,591	6,192	
101 cities	1,787	2,528	1,461
allpox:			
43 States	1,174	945	
101 cities	145	146	125
phoid fever:			
43 States	211	224	
101 cities	32	47	36
Deaths reported			
luenza and pneumonia:			
95 cities	1,060	1,079	
allpox:			
95 cities	0	0	

City reports for week ended February 25, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	5	1	0	0	0	2	1	3
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	0
Manchester	84,000	0	2	0	0	0	0	0	6
Vermont:									
Barre	[1] 10,008	1	0	0	0	0	0	0	0
Burlington	[1] 24,089	0	0	0	0	0	0	0	2
Massachusetts:									
Boston	787,000	51	48	17	5	1	543	6	17
Fall River	131,000	2	4	4	0	0	0	0	4
Springfield	145,000	8	3	12	1	1	4	73	4
Worcester	193,000	8	4	8	0	0	17	63	1
Rhode Island:									
Pawtucket	71,000	0	1	1	0	0	2	15	4
Providence	275,000	7	9	9	0	1	44	12	6
Connecticut:									
Bridgeport	([2])	3	8	3	0	0	0	0	8
Hartford	164,000	5	8	4	1	0	0	1	7
New Haven	182,000	13	2	2	0	0	218	66	10
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	24	13	14	--------	1	533	57	21
New York	5,924,000	197	211	313	55	33	433	0	166
Rochester	321,000	16	10	13	--------	1	8	9	5
Syracuse	185,000	15	4	7	--------	0	56	8	2
New Jersey:									
Camden	131,000	5	5	5	0	0	3	1	5
Newark	459,000	41	13	10	7	0	337	20	20
Trenton	134,000	4	3	5	1	0	12	1	5
Pennsylvania:									
Philadelphia	2,008,000	106	76	56	1	14	166	106	69
Pittsburgh	637,000	35	22	33	--------	0	251	130	23
Reading	114,000	12	3	3	--------	0	2	0	3
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	12	9	4	0	2	289	0	16
Cleveland	960,000	45	30	65	3	0	48	196	21
Columbus	285,000	13	4	0	0	0	15	6	9
Toledo	295,000	58	7	4	6	6	274	8	8
Indiana:									
Fort Wayne	99,900	1	2	3	0	0	1	0	4
Indianapolis	367,000	28	8	13	0	1	20	84	12
South Bend	81,700	2	1	0	0	0	0	0	2
Terre Haute	71,900	1	1	0	0	0	1	0	2
Illinois:									
Chicago	3,048,000	119	87	116	15	11	21	58	98
Springfield	64,700	8	1	0	0	0	0	13	2

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended February 25, 1928—Continued

Division, State, and city	Population July 1, 1923, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit	1,290,000	36	59	37	7	6	437	56	53
Flint	136,000	14	5	0	0	0	10	165	7
Grand Rapids	156,000	1	8	0	0	1	19	7	0
Wisconsin:									
Kenosha	52,700	29	2	0	0	0	1	1	3
Madison	47,600	15	0	0	0	0	0	3	4
Milwaukee	517,000	51	17	17	0	0	1	31	8
Racine	69,400	6	2	0	0	0	0	5	0
Superior	[1] 39,671	1	0	3	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	1	0	0	0	0	0	4	2
Minneapolis	434,000	30	16	9	0	1	2	35	5
St. Paul	248,000	19	14	3	0	0	0	59	5
Iowa:									
Davenport	[1] 52,469	3	1	1	0		0	0	
Des Moines	146,000	0	3	1	0		0	0	
Sioux City	78,000	6	2	0	0		7	9	
Waterloo	36,900	2	1	0	0		0	2	
Missouri:									
Kansas City	375,000	31	7	7	0	0	18	156	9
St. Joseph	78,400	1	2	0	0	0	0	16	5
St. Louis	830,000	30	46	42	3	0	107	14	
North Dakota:									
Fargo	[1] 26,403	4	0	0	0	0	0	5	0
Grand Forks	[1] 14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	1	0	0	0		0	0	
Sioux Falls	[1] 30,127	0	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	34	1	1	0	0	0	32	0
Omaha	216,000	7	4	0	0	0	1	2	4
Kansas:									
Topeka	56,500	44	1	1	0	0	0	3	1
Wichita	92,500	9	3	2	0	0	1	0	1
SOUTH ATLANTIC									
Delaware									
Wilmington	124,000	3	2	0	0	0	2	5	
Maryland:									
Baltimore	808,000	120	30	32	43	4	587	22	35
Cumberland	[1] 33,741	0	0	1	0	0	0	0	1
Frederick	[1] 12,035	0	0	0	0	0	0	0	0
District of Columbia									
Washington	528,000	30	17	38	2	2	54	0	22
Virginia:									
Lynchburg	30,500	1	0	2	0	0	27	0	0
Norfolk	174,000	23	2	1	0	0	35	1	7
Richmond	189,000	3	3	3	0	4	117	4	11
Roanoke	61,900	16	1	2	0	0	9	1	0
West Virginia:									
Charleston	50,700	1	0	0	0	0	0	0	2
Wheeling	[1] 56,208	3	1	1	0	0	1	1	6
North Carolina:									
Raleigh	[1] 30,371	4	0	0	0	0	96	0	1
Wilmington	37,700	2	1	0	0	0	26	0	3
Winston-Salem	71,800	6	0	2	0	0	261	16	7
South Carolina:									
Charleston	74,100	0	0	0	19	0	2	0	6
Columbia	41,800	14	1	1	0	0	56	23	6
Greenville	[1] 27,311	1	0	0	0	0	36	8	0
Georgia:									
Atlanta	(2)	3	3	1	35	5	4	6	14
Brunswick	[1] 16,809	0	0	0	0	0	44	6	1
Savannah	94,900	1	0	3	8	1	15	0	2
Florida:									
Miami	[1] 69,754	6	3	2	2	0	0	7	1
St. Petersburg	[1] 26,847		0			0			1
Tampa	102,000	15	2	2	0	0	0	3	4

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended February 25, 1928—Continued

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	1	0	0	0	1	18	0	8
Lexington	47,500	0		0	0	0	4	0	2
Louisville	311,000	2	5	2	1	0	74	7	13
Tennessee:									
Memphis	177,000	5	4	0	0	0	93	40	5
Nashville	137,000	0	1	4	0	0	22	4	4
Alabama:									
Birmingham	211,000	6	3	1	21	2	31	7	9
Mobile	66,800	0	1	0	6	3	0	0	3
Montgomery	47,000	4	1	0	4		3	1	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	2	0	0	0		3	0	
Little Rock	75,900	1	1	1	13	1	231	1	1
Louisiana:									
New Orleans	419,000	2	12	16	5	3	1	0	19
Shreveport	79,500	7	0	3	0	1	105	1	2
Oklahoma:									
Oklahoma City	(2)	2	2	3	7	0	15	3	10
Tulsa	133,000	20	1	1	0		0	32	
Texas:									
Dallas	203,000	36	6	4	4	3	1	0	7
Fort Worth	159,000	25	2	2	0	2	0	3	8
Galveston	49,100	0	1	4	0	0	7	1	3
Houston	[1] 164,954	3	3	13	4	1	26	1	7
San Antonio	205,000	1	2	6	4	9	113	0	27
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	1	0	0	0	0	0	0
Great Falls	[1] 29,883	7	0	0	0	2	1	1	1
Helena	[1] 12,037	0	0	0	0	0	0	0	1
Missoula	[1] 12,668	0	1	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	0	0	0	0	0	0	1	0
Colorado:									
Denver	285,000	57	11	3		2	15	85	15
Pueblo	43,900	9	1	1	0	0	3	0	9
New Mexico:									
Albuquerque	[1] 21,000	0	1	0	0	0	38	1	1
Utah:									
Salt Lake City	133,000	22	2	2	0	0	0	0	2
Nevada:									
Reno	[1] 12,665	0	0	2	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	23	7	4	0		196	13	
Spokane	109,000	26	3	0	0		0	0	
Tacoma	106,000	12	2	1	0	0	37	18	2
Oregon:									
Portland	[1] 282,383	34	8	2	1	1	7	0	8
California:									
Los Angeles	(2)	64	35	37	40	4	21	60	23
Sacramento	73,400	7	2	1	0	0	11	2	4
San Francisco	567,000	96	21	20	2	2	28	46	5

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended February 25, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	3	0	0	0	0	0	0	0	1	17
New Hampshire:											
Concord	0	1	0	0	0	0	0	0	0	0	8
Manchester	3	4	0	0	0	1	0	0	0	0	14
Vermont:											
Barre	0	3	0	0	0	2	0	0	0	0	2
Burlington	1	1	0	0	0	0	0	0	0	0	19
Massachusetts:											
Boston	80	87	0	0	0	12	2	0	0	70	265
Fall River	3	12	0	0	0	2	0	2	0	1	25
Springfield	8	20	0	0	0	2	1	0	0	3	40
Worcester	10	10	0	0	0	7	0	0	0	4	60
Rhode Island:											
Pawtucket	1	5	0	0	0	0	0	0	0	0	20
Providence	10	23	0	0	0	1	0	0	0	4	57
Connecticut:											
Bridgeport	13	3	0	0	0	5	0	0	0	2	46
Hartford	6	8	0	0	0	2	0	0	0	0	47
New Haven	11	5	0	0	0	0	0	1	0	35	53
MIDDLE ATLANTIC											
New York:											
Buffalo	25	45	1	0	0	10	0	0	0	38	157
New York	297	440	1	0	0	105	7	3	1	149	1,714
Rochester	15	11	0	0	0	3	1	1	0	6	74
Syracuse	12	15	0	0	0	3	0	0	0	24	57
New Jersey:											
Camden	7	1	0	0	0	1	0	0	0	0	33
Newark	30	33	0	0	0	5	0	0	0	21	164
Trenton	5	4	0	0	0	0	1	0	0	3	45
Pennsylvania:											
Philadelphia	95	87	0	0	0	41	2	2	0	62	577
Pittsburgh	34	24	0	0	0	17	0	4	0	19	188
Reading	3	28	0	0	0	0	0	0	0	2	26
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	19	24	2	0	0	9	0	0	0	6	149
Cleveland	51	46	0	0	0	8	0	0	1	70	182
Columbus	10	18	1	0	0	4	0	0	0	0	72
Toledo	14	8	1	0	0	6	0	1	0	7	80
Indiana:											
Fort Wayne	5	3	0	1	0	1	0	0	0	0	29
Indianapolis	11	22	13	8	0	6	1	0	0	7	112
South Bend	3	0	1	1	0	0	0	0	0	0	13
Terre Haute	3	1	1	3	0	0	0	0	0	0	18
Illinois:											
Chicago	142	117	3	1	0	61	3	1	0	114	795
Springfield	2	10	0	0	0	0	0	0	0	3	21
Michigan:											
Detroit	99	103	2	3	0	34	1	0	0	59	331
Flint	8	28	1	0	0	1	0	0	0	7	23
Grand Rapids	11	7	0	0	0	1	0	0	0	0	32
Wisconsin:											
Kenosha	3	1	0	3	0	0	0	1	0	6	11
Madison	4	2	0	0	0	0	0	0	0	0	12
Milwaukee	29	49	2	0	0	8	0	0	0	16	100
Racine	5	7	0	0	0	2	0	0	0	6	11
Superior	4	0	1	0	0	1	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota:											
Duluth	7	8	1	0	0	2	0	0	0	13	20
Minneapolis	61	27	5	0	0	2	1	0	0	13	106
St. Paul	36	15	5	0	0	5	0	0	0	2	--------

City reports for week ended February 25, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL—contd.											
Iowa:											
Davenport	2	9	2	1			0	0		0	
Des Moines	6	20	1	23			0	0		0	
Sioux City	1	1	1	1			0	0		1	
Waterloo	2	10	0	5			0	0		0	
Missouri:											
Kansas City	12	15	3	7	0	7	0	1	0	12	114
St. Joseph	3	4	0	14	0	2	0	1	0	0	35
St. Louis	43	38	4	3	0	14	0	0	0	14	273
North Dakota:											
Fargo	3	5	0	0	0	0	0	0	0	6	11
Grand Forks	0	4	1	0			0	0		0	
South Dakota:											
Aberdeen	2	0	0	0			0	0		6	
Sioux Falls	3	1	0	0			0	0		0	6
Nebraska:											
Lincoln	2	8	0	4	0	0	0	0	0	11	17
Omaha	4	5	10	3	0	0	0	0	0	0	55
Kansas:											
Topeka	1	5	0	0	0	1	0	0	0	5	15
Wichita	2	8	1	14	0	2	0	0	0	8	19
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	1	0	0	0	0	0	1	0	0	21
Maryland:											
Baltimore	43	43	1	1	0	23	2	8	0	29	248
Cumberland	1	0	0	0	0	0	0	0	0	0	12
Frederick	0	0	0	0	0	0	0	0	0	0	2
District of Col.:											
Washington	27	49	1	0	0	9	0	1	0	3	150
Virginia:											
Lynchburg	0	2	0	0	0	2	0	0	0	12	18
Norfolk	1	34	0	0	0	3	0	0	0	4	
Richmond	4	8	0	0	0	5	0	0	0	0	59
Roanoke	1	1	0	0	0	0	0	0	0	1	15
West Virginia:											
Charleston	0	1	0	5	0	0	1	0	0	0	15
Wheeling	2	2	0	0	0	1	1	0	0	0	25
North Carolina:											
Raleigh	0	2	0	1	0	0	0	0	0	0	13
Wilmington	0	0	0	0	0	0	0	0	0	5	10
Winston-Salem	0	1	3	0	0	1	0	0	0	0	26
South Carolina:											
Charleston	0	2	0	3	0	1	0	0	0	0	37
Columbia	0	2	0	0	0	1	0	0	0	13	27
Greenville	0	0	0	0	0	1	0	0	0	2	11
Georgia:											
Atlanta	4	11	7	0	0	5	0	0	0	0	86
Brunswick	0	0	0	0	0	0	0	0	0	0	6
Savannah	1	1	0	5	0	0	1	0	0	0	36
Florida:											
Miami	1	0		0	0	1	1	0	0	2	34
St. Petersburg	0		0		0	0	0		0		23
Tampa	1	1	0	0	0	2	1	0	0	0	34
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	0	0	0	0	1	0	0	0	2	20
Lexington		0		0	0	1		0	0	2	15
Louisville	6	23	0	1	0	4	1	0	0	0	88
Tennessee:											
Memphis	4	9	2	3	0	15	1	2	1	1	86
Nashville	5	2	1	1	0	1	0	1	0	2	58
Alabama:											
Birmingham	3	2	6	2	0	4	1	0	1	2	73
Mobile	1	1	1	1	0	1	1	1	0	0	36
Montgomery	0	0	1	0			0	0		0	

City reports for week ended February 25, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	1	0	0			0	0		1	
Little Rock	2	0	0	0	0	2	0	0	0	0	
Louisiana.											
New Orleans	7	6	1	0	0	14	2	3	0	1	169
Shreveport	0	2	1	1	0	1	0	1	0	1	21
Oklahoma:											
Oklahoma City	3	4	3	12	0	0	0	0	0	2	39
Tulsa	2	4	0	3			0	3		3	
Texas:											
Dallas	3	17	4	1	0	1	0	0	0	1	50
Fort Worth	1	11	2	1	0	1	0	0	0	0	
Galveston	0	0	0	0	0	1	0	0	0	0	11
Houston	1	2	3	0	0	2	0	0	0	1	65
San Antonio	1	2	0	0	0	8	0	0	0	0	86
MOUNTAIN											
Montana:											
Billings	0	2	0	1	0	0	0	0	0	1	7
Great Falls	2	1	1	0	0	2	0	0	0	1	11
Helena	0	0	0	1	0	1	0	0	0	0	10
Missoula	0	0	0	0	0	2	0	0	0	0	6
Idaho:											
Boise	0	0	1	0	0	0	0	0	0	0	5
Colorado:											
Denver	14	8	2	1	0	11	1	0	0	12	100
Pueblo	0	11	1	0	0	0	0	0	0	3	18
New Mexico:											
Albuquerque	2	0	0	0	0	4	0	0	0	0	11
Utah:											
Salt Lake City	3	1	2	4	0	3	0	0	0	13	
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	2
PACIFIC											
Washington:											
Seattle	11	5	5	4			0	0		4	
Spokane	6	14	6	45			0	0		0	
Tacoma	2	5	4	0	0	1	1	0	0	6	26
Oregon:											
Portland	7	3	10	14	0	4	1	0	0	0	80
California:											
Los Angeles	33	24	7	0	0	36	2	1	1	7	284
Sacramento	2	4	0	0	0	2	0	1	0	0	
San Francisco	15	39	5	0	0	14	0	0	0	11	154

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Fall River	0	0	0	0	0	0	0	1	0
Worcester	0	1	1	1	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	7	2	7	2	0	0	1	3	1
New Jersey:									
Newark	0	1	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	1	0	0	0	0	0	1	0	0
Pittsburgh	2	0	0	0	0	0	0	0	0

City reports for week ended February 25, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	0	1	0	0	0	0	0	0	0
Columbus	0	0	2	2	0	0	0	0	0
Toledo	3	1	0	0	0	0	0	0	0
Illinois:									
Chicago	6	4	1	0	0	0	0	0	0
Michigan:									
Detroit	2	0	1	0	0	0	0	0	0
Grand Rapids	4	0	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee	1	1	1	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	1	0	0	0	0	0	0
St. Paul	2	0	0	0	0	0	0	0	0
Missouri:									
St. Louis	0	1	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	0	1	0	0	0	0	0
Nebraska:									
Omaha	1	0	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	2	1	0	0	1	0	0
North Carolina:									
Raleigh	0	0	0	0	0	1	0	0	0
Winston-Salem	0	0	0	0	0	1	0	0	0
South Carolina:									
Charleston	0	0	0	0	1	0	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Birmingham	0	0	0	0	0	1	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	1	0	0	0
Louisiana:									
New Orleans	0	0	1	1	0	0	0	0	0
Shreveport	0	0	1	0	0	1	0	0	0
Texas:									
Dallas	0	0	0	0	1	1	0	0	0
Fort Worth	0	0	0	0	0	1	0	0	0
Houston	2	1	0	0	1	1	0	0	0
MOUNTAIN									
Montana:									
Missoula	0	0	1	0	0	0	0	0	0
Colorado:									
Denver	6	2	0	1	0	0	0	0	0
Pueblo	1	0	0	0	0	0	0	0	0
Utah:									
Salt Lake City	1	2	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	0	------	0	------	0	------	0	1	------
Tacoma	1	1	0	0	0	0	0	0	0
Oregon:									
Portland	1	1	0	0	0	0	0	0	0
California:									
Sacramento	0	1	0	0	0	0	0	0	0
San Francisco	1	1	0	0	0	0	0	0	0

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended February 25, 1928, compared with those for a like period ended February 26, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below:

Summary of weekly reports from cities, January 22 to February 25, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

	Week ended—									
	Jan. 29, 1927	Jan. 28, 1928	Feb 5, 1927	Feb 4, 1928	Feb 12, 1927	Feb 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928
DIPHTHERIA CASE RATES										
101 cities	177	[2] 193	191	190	177	167	203	175	179	174
New England	163	172	146	193	174	136	133	172	149	138
Middle Atlantic	194	251	229	278	188	230	277	234	190	224
East North Central	175	186	201	145	179	175	168	169	198	169
West North Central	127	131	123	113	154	99	164	125	109	125
South Atlantic	198	146	143	167	222	112	191	149	191	156
East South Central	101	[2] 87	127	55	61	55	86	55	117	35
West South Central	203	164	232	152	149	128	170	124	194	198
Mountain	197	124	188	106	152	44	161	186	72	71
Pacific	167	161	217	156	167	133	188	82	151	161
MEASLES CASE RATES										
101 cities	425	[2] 583	570	724	652	791	810	892	862	998
New England	323	1,078	379	1,503	339	1,614	181	1,657	228	1,906
Middle Atlantic	46	483	41	618	45	647	68	700	71	877
East North Central	536	368	695	359	786	440	1,009	531	1,015	565
West North Central	297	138	453	222	683	216	564	240	960	255
South Atlantic	256	1,533	536	1,822	359	1,959	792	2,246	651	2,406
East South Central	188	[2] 1,621	269	1,192	451	1,132	467	1,347	461	1,202
West South Central	376	500	562	916	451	1,304	562	1,899	591	1,959
Mountain	4,447	88	7,217	115	7,845	186	9,665	97	10,624	168
Pacific	1,504	434	1,538	708	2,220	718	2,774	692	2,865	749
SCARLET FEVER CASE RATES										
101 cities	380	[2] 278	403	270	390	300	438	291	424	295
New England	539	372	509	359	537	432	470	441	542	414
Middle Atlantic	378	288	433	295	423	333	581	330	531	335
East North Central	347	301	324	289	325	310	322	280	366	285
West North Central	487	273	521	247	499	290	540	265	445	275
South Atlantic	253	200	245	207	258	231	249	228	218	282
East South Central	319	[2] 116	243	130	223	135	243	190	183	185
West South Central	112	128	124	132	74	100	66	116	116	120
Mountain	1,605	301	1,515	380	1,246	540	1,246	345	1,192	203
Pacific	826	296	436	217	389	192	340	230	313	233

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] Louisville, Ky., not included.

Summary of weekly reports from cities, January 22 to February 25, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SMALLPOX CASE RATES

	Week ended—									
	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928
101 cities	26	[2] 23	25	21	26	21	33	20	25	24
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	17	12	22	9	15	14	28	12	15	13
West North Central	79	121	53	117	71	109	81	101	63	92
South Atlantic	60	14	43	18	63	21	60	26	45	26
East South Central	86	[2] 29	101	20	81	15	132	25	71	40
West South Central	41	20	79	12	66	16	62	20	50	8
Mountain	9	133	9	115	18	44	27	168	0	62
Pacific	71	59	63	59	76	69	94	18	104	125

TYPHOID FEVER CASE RATES

	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928
101 cities	7	[2] 8	7	7	7	7	9	5	8	5
New England	5	21	9	14	5	9	2	5	9	7
Middle Atlantic	4	5	9	5	5	6	10	3	1	5
East North Central	2	5	5	3	3	6	4	3	6	1
West North Central	8	8	4	2	6	6	10	4	8	4
South Atlantic	18	7	5	5	18	9	23	7	29	9
East South Central	35	[2] 29	5	15	10	5	30	15	25	20
West South Central	0	40	17	40	12	40	8	12	4	16
Mountain	18	0	0	9	0	0	0	0	18	0
Pacific	21	0	8	10	18	0	3	8	8	5

INFLUENZA DEATH RATES

	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928
95 cities	25	[2] 19	19	19	24	17	23	22	22	21
New England	9	7	5	0	2	7	9	11	12	7
Middle Atlantic	22	16	21	14	26	15	25	18	22	24
East North Central	21	12	9	13	22	10	19	12	17	14
West North Central	4	10	12	10	14	4	23	6	10	2
South Atlantic	49	11	27	23	23	30	31	35	41	28
East South Central	32	[2] 101	58	68	37	42	43	37	43	31
West South Central	72	78	64	45	38	57	38	90	25	74
Mountain	72	80	45	53	72	53	27	71	54	35
Pacific	14	20	7	34	21	20	17	27	17	20

PNEUMONIA DEATH RATES

	Jan. 29, 1927	Jan. 28, 1928	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928
95 cities	158	[2] 159	168	150	147	168	146	174	163	161
New England	158	126	188	126	165	149	102	170	184	147
Middle Atlantic	174	183	197	129	173	200	148	195	176	155
East North Central	132	121	121	129	128	114	121	137	145	156
West North Central	126	98	135	49	95	106	91	94	91	71
South Atlantic	189	210	222	198	168	224	234	216	253	228
East South Central	213	[2] 171	207	131	117	235	175	204	122	220
West South Central	200	267	149	209	144	201	204	279	161	271
Mountain	170	177	143	203	143	150	188	168	134	248
Pacific	107	145	121	128	114	182	176	172	131	115

[2] Louisville, Ky., not included

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,212,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended February 11, 1928.—The following report for the week ended February 11, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Aden.—Aden.
India.—Bassein, Bombay, Moulmein, Rangoon.
Dutch East Indies.—Makassar.
Straits Settlements.—Singapore.

CHOLERA

India.—Calcutta, Madras, Negapatam, Rangoon.
Straits Settlements.—Singapore.
Siam.—Bangkok.
French Indo-China.—Saigon.

SMALLPOX

Ceylon.—Colombo.
India.—Bassein, Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon, Vizagapatam.
French India.—Pondicherry.
Dutch East Indies.—Belawan-Deli.
China.—Shanghai.
Kwantung.—Dairen.
Manchuria.—Mukden.

ARABIA

Aden—Further relative to plague—February 8, 1928.—Information received under date of February 8, 1928, shows a total of 152 cases of plague at Aden, Arabia, with 74 deaths, from the date of reported outbreak, January 17, 1928. It was stated that the area of prevalence had not greatly increased.

AZORES

Plague—January 22–February 11, 1928.—During the period January 22 to February 11, 1928, five cases of plague with three deaths were reported in the Azores Islands. Of these, one case with one death occurred at Livramento, and four cases with two deaths at Rabo de Peixe and San Vicente.

BARBADOS

Malaria—1927.—During the month of October, 1927, malaria was found to be present in one Parish of the Island of Barbados, British West Indies, with rapid spread. At the close of the year 1,000 cases were estimated as present in the island, with 20 fatalities occurring among infants and persons of advanced years.

Measures to prevent spread.—Measures to eliminate the anopheline mosquito were enforced and efforts made to improve the living conditions of the laboring classes.

BRAZIL

Porto Alegre—Plague.—Information has been received under date of March 6, 1928, of the occurrence of two cases of plague at Porto Alegre, Brazil. The cases were stated to have been found in the prison.

CANADA

Provinces—Communicable diseases—Week ended February 25, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended February 25, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Influenza	41			2				43
Lethargic encephalitis				1				1
Poliomyelitis		1					1	2
Smallpox				51		8	3	62
Typhoid fever	4		14	10	1	2	2	33

Quebec Province—Communicable diseases—Week ended February 25, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended February 25, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	33	Scarlet fever	115
Diphtheria	67	Smallpox	13
German measles	11	Tuberculosis	58
Influenza	7	Typhoid fever	14
Measles	251	Whooping cough	26

CANARY ISLANDS

Plague, bubonic—Las Palmas—Year 1927.—Bubonic plague was reported as occurring at Las Palmas, Canary Islands, during the year 1927 as follows:

Date of notice	Cases	Deaths	Remarks
Jan. 13	1		
Feb. 23	1		
Oct. 11	4		Reported in Isleta Zone.
Nov. 25	1		
Dec. 5	2	1	Pneumonic; in Isleta Zone
Dec. 16	1		
Dec. 19	1	1	
Dec. 27	1		Reported in Isleta Zone.

Deaths from certain diseases—Las Palmas—Year 1927.—Deaths from certain diseases were reported from Las Palmas, Canary Islands, for the year 1927, as follows:

	Deaths		Deaths
Bronchitis	18	Puerperal septicemia	5
Cancer	49	Syphilis	19
Diarrhea and enteritis	267	Tuberculosis (pulmonary)	149
Diarrhea and enteritis (under 2 years)	23	Tuberculosis (all other forms)	42
Diphtheria	7	Typhoid fever	9
Heart disease	157	Whooping cough	14
Influenza	1	Other communicable diseases	12
Pneumonia	105	Other diseases of the respiratory organs	26

Population: 66,461, census of 1920.

Santa Cruz de Teneriffe—Plague—January 16, 1928.—The occurrence of a fatal case of plague was reported January 16, 1928, at Santa Cruz de Teneriffe, Canary Islands.

CUBA

Habana—Communicable diseases—February, 1928.—During the month of February, 1928, communicable diseases were reported in the city of Habana, Cuba, as follows:

Disease	New cases	Deaths	Remaining under treatment	Disease	New cases	Deaths	Remaining under treatment
Chicken pox	50		45	Measles	5		6
Diphtheria	9	3	1	Paratyphoid fever		1	
Leprosy			18	Scarlet fever	11		7
Malaria [1]	14	2	3	Typhoid fever [1]	19	3	33

[1] Many of these cases from the interior.

EGYPT

Plague—Suez—District of Manfalut—January 29–February 4, 1928.—During the week ended February 4, 1928, four cases of plague were reported in Egypt, of which three cases were reported at Suez and one case in the district of Manfalut.

Summary—January 1–February 4, 1928.—During the period January 1 to February 4, 1928, 6 cases of plague were reported in Egypt, as compared with 13 cases reported for the corresponding period of the year 1927.

GREAT BRITAIN

Open-air school installed—Liverpool.—Information has been received under date of February 10, 1928, of the opening of a free open-air school at Liverpool, England. The school is stated to be the largest open-air school yet erected. It comprises two units built around a central court, which is laid out as a flower garden. The classrooms are situated on the ground floor, the upper part of the building being allotted to administrative uses and library. The buildings are equipped with hot-water heating and are lighted mainly by skylights. Classrooms measure 24 by 20 feet, and each room may be thrown wide open to the air on two sides. There are three

assembly halls. The playgrounds allow an average of 120 feet to each child. The installation of the school is of special interest in view of the prevalence of pulmonary tuberculosis in the community, especially among the poorer classes.

JAPAN

Dysentery—Tokyo, city and prefecture—January 1–28, 1928.—During the period January 1 to 28, 1928, dysentery was reported at Tokyo, Japan, as follows: Tokyo city, cases, 54; deaths, 23; Tokyo Prefecture, outside the city, cases, 74; deaths, 35. Population: City, 1,995,567; prefecture, 2,489,577.

LATVIA

Communicable diseases—December, 1927.—During the month of December, 1927, communicable diseases were reported in the Republic of Latvia, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Poliomyelitis	1
Diphtheria	27	Puerperal fever	2
Erysipelas	12	Scarlet fever	193
Influenza	23	Tetanus	1
Lethargic encephalitis	2	Trachoma	21
Measles	305	Typhoid fever	73
Mumps	7	Whooping cough	18

Population: 1,950,000.

MALTA

Communicable diseases—December, 1927.—During the month of December, 1927, communicable diseases were reported in the island of Malta, as follows:

Disease	Cases	Disease	Cases
Bronchopneumonia	5	Puerperal fever	2
Chicken pox	16	Scarlet fever	2
Diphtheria	2	Trachoma	29
Erysipelas	2	Tuberculosis	13
Influenza	6	Typhoid fever	48
Malta fever (undulant)	42	Whooping cough	1
Pneumonia	2		

Population, estimated, civil, 227,440.

MEXICO

Atotonilco—Further relative to smallpox outbreak[1]*—Vaccination.*—According to information received under date of February 29, 1928, the outbreak of smallpox at Atotonilco, State of Jalisco, Mexico, was under control, few new cases being reported. Indigent patients were being treated in lazarettoes. More than 14,000 persons were stated to have been vaccinated.

SWEDEN

Goteborg—Vital statistics, 1927.—According to statistics prepared by the Goteborg Medical Association, the total number of cases of

[1] Public Health Reports, Mar. 9, 1928, p. 586.

sickness reported by the district physicians during the year 1927 was 14,326, or 6.2 cases for every 100 inhabitants. In the year 1926 the average per 100 inhabitants was 4.4. In 1925, however, the average was 6.4 cases, and a comparison of the figures for the five-year period 1922–1926 shows that the frequency of cases of sickness during 1927 was about normal.

During 1927, 293 cases of diphtheria were reported, an increase over the preceding year of 140 per cent. Scarlet fever accounted for 290 cases and typhoid and paratyphoid fever for 26 cases. The latter figure is the lowest during the past 30 years. In 1925 there were reported 134 cases of diphtheria, 305 cases of scarlet fever, and 143 cases of typhoid and paratyphoid fever.

As compared with the year 1926, the number of cases of influenza increased 150 per cent. An outbreak of measles occurred during 1927, the number of cases reported being 1,286. In 1926 only 4 cases of measles occurred.

The number of deaths reported during the year 1927 was 2,290, or 9.9 for every 1,000 inhabitants. This was an increase of 10 per cent over the figures for the year 1926, which showed the lowest mortality figures recorded for a number of years.

Four hundred and fifty-eight deaths were due to diseases of the heart and blood vessels, while 327 deaths were caused by tuberculosis. Cancer caused 241 deaths, and deaths due to influenza totaled 92, an increase of 185 per cent, as compared with the preceding year. Diphtheria caused 11 deaths.

UNION OF SOUTH AFRICA

Plague—Smallpox—Typhus fever—January 15–21, 1928.—During the week ended January 21, 1928, a fatal case of plague was reported in Cape Province, Union of South Africa. The case occurred in a European and on a farm. During the same period smallpox was reported on two farms in Wodehouse District, Cape Province. Fresh outbreaks of typhus fever were reported for the same period in the Cape Province, occurring at 8 localities in 5 districts.

During the month of December, 1927, 83 cases of typhus fever with 15 deaths were reported in the native population of the Union of South Africa, of which 70 cases with 13 deaths occurred in the Cape Province and 13 cases, 2 deaths, in the Province of Natal. In the European population, one case of typhus fever occurred in Natal and two cases in the Cape Province.

East London—Typhoid fever—January 8–28, 1928.—During the three weeks ended January 28, 1928, 56 cases of typhoid fever with 5 deaths were reported at East London, Union of South Africa. The infection was stated to have been introduced from country districts. The occurrence was in the native population.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug 28-Sept. 24, 1927	Sept. 25-Oct 22, 1927	Oct. 23-Nov 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11
China:																		
Amoy	C	2	28	72	16													
	D		7	3														
Canton	C	8	31	36	14	12		1										
	D	5	16	25	14	11		1										
Foochow	C	P	P	P	P													
Hong Kong	C	2	P	1	P													
	D	1																
Shanghai (settlement and concession)— Foreigners only	C		1	6	3													
Including natives	D		20	74	7													
Swatow	C	72	42	P	P	P												
	D	1		P	P	P												
Tientsin	C	P	P	15	2	P												
Dutch East Indies. Java—Batavia	C					28	2	1										
	D					18	2	1										
India	C	46,137	45,163	31,390	20,160	23,047	8,102	5,997	5,766	5,274	4,624	3,960	3,550					
	D	24,081	22,051	15,895	10,371	12,863	4,835	3,672	3,355	3,164	2,617	2,353	2,046					
Bassein	D	16															1	
Bombay	C	75	42	3		2												
	D	35	30	2		2												
Calcutta	C	95	87	76	101	199	156	119	87	66	69	42	43	22	39			
	D	48	40	39	64	138	106	77	55	43	48	34	27	16	18	24	38	32
Madras	C	424	547	59	14	13			1					1	1			
	D	204	278	48	8	7	1		1					1		3		1
Madras Presidency	C	11,491	7,660	3,056	2,050	3,073	1,484	861	878	479	503	382	482					
	D	4,807	3,513	1,581	1,055	1,736	802	528	491	283	241	209	254					
Negapatam	C															4		
	D	2	4												4	1		1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C, indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11
India—Continued																		
Rangoon	C	2	1	2	6	2	3	1	2	2	1	2		1	4			
	D	2	1	2	5	5	2	1	2	1	1	1		1			1	1
Tuticorin	C				1			6		2								
	D				1	37		6	6	2								
India (French):																		
Chandernagor	C	1	1	1		6	2	2	2	2	6	3	4	1				
	D	1	1			6	2	2	2	2	4	2	2	1				
Karikal	C	56	18	1		1				1			6	2				
	D	45	12	1		1				1			4					
Pondicherry	C	37	12	15		1		5	3	17	4	1	2	4				
	D	24	11	15		1		5	1	15	6	1	2	3				
Indo-China: Saigon	C			1	1								2	1	1	1		2
	D												1					1
Iraq [1]																		
Japan: Yokohama	C	1																
	D	1																
Philippine Islands: Manila	C	1	1															
Siam	C	81	77	40	18	110	19	29	18	32	24	24	13	49	50			
	D	59	53	24	11	76	11	19	13	21	18	21	5	36	34			
Bangkok	C	6	2	3	5	4		1	1	1	2	3	7	9	11	28	28	34
	D	1	1	1	3	2		1		1	2	1	3	5	7	16	26	17
Straits Settlements: Singapore	C					7	1	2		2	3	15	3	2	2			1
	D					5	2			2	1	4	5	2	1			
On vessel:																		
S. S. Adrastus: At Yokohama, Japan	C		1															
	D		1															
S. S. Tabaristan: At Basra, Iraq	C				1													

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 106 cases, 71 deaths; Kerbelah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928	
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Indo-China (French):													
Annam	C	911	1,628	640	226	13	73	38	16	2		79	95
Cambodia	C	87	89	73	180	56	1	28	21	12	39	30	9
Cochin-China	C	257	68	144	178	21	27	52	17	38	58	46	119
Laos	C	20	190	36	67	10							
Tonkin	C	1,093	180	24	1			1			2	1	
Kwangchow-wan	C		1	15									

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927					January, 1928				February, 1928		
								3	10	17	24	31	7	14	21	28	4	11	18
Algeria: Oran	C		4	1		2													
	D		3	1															
Arabia: Aden	C													19	13	22	54	89	63
	D													7	8	8	33	55	50
Argentina:																			
Bahia Blanca district	C						1	1	1										
Buenos Aires	C																	2	
Cordoba Province	C		2		P	P	10				1	1							
Entre Rios	C		5																
Firmat	C									1									
Quilino	C						1	1	1										
Rosario	C						1	1	1	1	2	3				4			1
Santiago Province	C																		1
Ucacha	C									1									
Azores: St. Michaels Island	C	2	2	2	3	3	1	1	1		1		1		3	1	2	2	
	D			1	1				1					1	1	1	1	1	
Brazil:																			
Porto Alegre [1]																			
Rio de Janeiro	C														2				3

[1] 2 cases at Porto Alegre Mar. 3, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	February, 1928 4	11	18
British East Africa:																			
Tanganyiki	C	P	P		P	P	P	P	P	P	P								
Uganda	C	528	456	228	99	99	24	27	16										
	D	413	345	158	88	96	21	25	15										
Canary Islands:																			
Las Palmas	C				9		1			2			2	1	1				1
	D													1	1				
Teneriffe	C														1	3	3	3	
	D														1		3		
Ceylon: Colombo	C		1	3	1		1	1		4	3	2	1	1	1	1	1		3
	D			3					2	4	3	1	1	1	1	1			1
China:																			
Amoy	C	P																	
Tungliao	D				200														
Tientsin	C		2																
Dutch East Indies:																			
Balik-Papan	C										1								
	D										1								
Celebes—Makassar	C					6	1		1		2	1		3	2	1	1	1	
	D					6	1		1		2	1		2	2	1	1	1	
Java	D			432	779	829	291	275											
Batavia and West Java	C	40	71	68	130	132	45	43	32	34	32	36	24	36					
	D	40	71	68	129	132	14	43	32	33	32	36	24	36					
Cheribon	C							1											
	D							1											
East Java and Madura	C	29	28	18	17	10	5	3			3	2	1						
	D	29	27	18	17	10	5	3			3	2	1						
Pasoeroean Residency	C						P	P	P										
Surabaya Residency	C							P											
Surakarta Residency	C					P	P	P											
Egypt:																			
Alexandria	C		2	1			5	3	2	2	3	2					1		1
	D						5	2			1	1					1		1
Suez	C			1										1	1		3		3
	D													1	1		1		3

Greece:																			
Athens and Piræus	C		1	3	1							2	1						
	D				1							1							
Mitylene	C		1	5	1	3	1	1	1										
Patras	C		2	2	1	1													
	D				1	1													
Hawaii Territory: Hawaii	D		1																
India	C	404	1,391	2,710	3,246	3,600	1,193	1,228	1,348	1,749	1,085	1,197	2,596						
	D	241	836	1,428	1,792	2,065	668	742	773	1,085	733	899	1,804						
Bassein	D	23	12	14	8	4	3			1	2	13	2		3	3		2	1
Bombay	C	14	14	7	4							1		2	5		2		
	D	13	11	5	3							1		1	2	2	3	2	6
Calcutta	C			18															
	D			10												1			
Madras Presidency	C	255	620	465	583	470	190	158	220	223	174	167	56	153					
	D	115	321	230	298	282	111	61	108	79	69	27	38	72					
Rangoon	C	21	15	6	11	11	5	2	6	2	2	4	4	7	8				
	D	20	14	6	11	11	5	2	5	3	2	3	4	7	7	7	6	10	12
Indo-China: Saigon	C			2		1													
Nigeria: Lagos	C					17	4	3	4	2	2	1	1	6	2	3	3		
	D					17	4	3	3	3	1	1	1	5	3	3	3		
Senegal:																			
Baol	C	41	23	72	95	P		P											
	D	22	13	33	40														
Cayor	C	126	227	463	176	48													
	D	74	166	233	88	28													
Dakar	C	67	46	20	1														
	D	41	32	12															
Louga	C			5	8														
	D			4															
M'Bour	C	28																	
	D	23																	
Rufisque	C	104	44	16															
	D	82	38	12															
Thies	C	7		9	1	1													
	D	3		7															
Tivaouane	C	43																	
	D	29																	
Siam	C				13	1	2			1	1	7	4	4	5				
	D				9		1			1	1	1	5	4	1				
Bangkok	C				2							1				1			1
	D					1						1				1			1
Straits Settlements: Singapore	C					1												1	1
	D					1												1	1
Turkey: Constantinople	C			1	1		1	1											
	D				1			1											
Union of South Africa:																			
Cape Providence	C					2			2										
	D					2			1										
Orange Free State	C	4				1	8	P											
	D	4				1	6												

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct 23-Nov 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18
U. S. S. R.:																			
Chita district	C				1														
	D				1														
Northern Caucasus	C			14	1														
	D			10															
On vessel:																			
At La Plata, from Rosario, Argentina	C											1							
S. S. Aghios Gerasimos at Vigo, Spain	C					3													

Beirut, Syria, 1 case, Dec. 1-10.

Place		July	August	September	October	November	December	January
Algeria: Algiers	C				2			
British East Africa: Kenya	C	13	61	21	18	28	16	
Ecuador: Guayaquil	C	5	7	3	4	9	5	4
	D					3	2	4
Indo-China (French)	C			14	3	3	4	
Madagascar	C	46	98	170	166	209	317	
	D	43	89	154	155	189	261	
Ambositra Province	C	6	1		6	1	18	
	D	6	1		6	1	10	
Antsirabe Province	C		34	5	19	18	72	
	D		34	4	19	17	72	
Itasy Province	C	14	11	21	16	26	62	
	D	14	7	20	15	25	54	
Madagascar—Continued.								
Moramanga Province	C	5	4	3	24	46	25	
	D	5	4	3	20	41	22	
Tananarive Province	C	21	48	142	99	170	139	
	D	19	43	127	93	153	108	
Mauritius	C			1				
Nigeria	C	9	8	15	27	16	20	16
	D	7	8	14	27	16	18	16
Peru	C	8	11	15	14	6	14	
	D	7	6	6	5	2	4	
Callao	D	3					3	
Lima	C						7	
	D				1	1	1	

SMALLPOX

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
Algeria	C	376	459	382	683	661		68	55	47	81	26				18	11			
Algiers	C									3	3	4		2	3	1	7			
Oran	C	14	9	16	11	20	9	11	10	9	8	15	2	4	2	2	4			
Arabia: Aden	C	2				1		1	1	1	1									
	D	1																		
Brazil:																				
Para	C		1																	
Rio de Janeiro	C	4	6	10		1														
	D	4	4	9		1														
British East Africa: Tanganyiki	D		21	8	P	P	P	P	P					6	4					
British South Africa:																				
Northern Rhodesia	C	48	55	39	164	185	57	15	125	55	2	81	141	12						
	D	2	1	2	11	64	18	7	28	9		8	23							
Southern Rhodesia	C					3				2	1									
Canada:																				
Alberta	C	42	17	17	23	10	7	3	3	6		3	3	5	1	19	1	6		3
Calgary	C	5	1																	
Edmonton	C				1	1	6		1	1			3	2	1			2	1	
British Columbia: Vancouver	C			2					4		1	3	3	1	11	3	1	11	2	1
Manitoba	C		13	9	7	19	1	3	1	2	2	2	2	5		1				
Winnipeg	C	3	5	4	2	2			1	1	1			1	1	1				
New Brunswick	C			2							1									1
Nova Scotia	C			1	1															
Halifax	C				1															
Ontario	C	63	60	22	96	264	71	90	82	104		53	83	76	52	77	63	51	40	51
Hamilton	C							2												
Kingston	C					1					1							1		
Ottawa	C	37	27	40	57	134	10	19		34	18	9	10	23	20	16	23	9	11	3
Toronto	C	5		2	10	34		25	14		7		11	10	8	5	1	6	4	4
Windsor	C				9															
Quebec	C	12	1		8	25	8	5	3		14	3	10	17	7		11	8	11	
Montreal	C					1					1		1	6	3	4	1		5	1
Quebec	C							2		2		2		3		5				2
Riviere du Loup	C					3														
Saskatchewan	C	25	14	68	31	34	9	15	19	15	12	13	15	12	39	15	9	34	7	8
Moose Jaw	C		10	16	3					1		1	2	1	4	2	3	2		2
Regina	C	2	8		5	1				1										
Saskatoon	C								2			4			13	1		1		2

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	February, 1928 4	11	18	25
Ceylon: Colombo	C		1			1		2							1			2		
	D		1					1							1					
China:																				
Antung	C	3												1						
Canton	C			1																
	D			1																
Chefoo	C			1	P		P													
	D			1																
Foochow	C	P	P	P	P	P	P		P	P	P	P		P						
Hong Kong	C	3	1	2										1	1					
	D	3	1	2									1							
Manchuria—																				
Changchun	C	4					1									4				
Dairen	C				1	2				1			2	3						
	D				1															
Fushun	C	1		1		1														
Harbin	C	1								2		1				2				
Mukden	C	3			2	1										1				
Pensihu	C	1			1															
Shanghai—																				
Foreigners only	C														1	2		2		
Including natives	D														3	2	3			
Tientsin	C	11		4	13	8	4	1	2	2	2									
Curacao (Alastrim)	C														2				3	
Dutch East Indies:																				
Borneo—																				
Samarinda District	C					P														
South and East Borneo Residency	C		P																	
Java—																				
Batavia and West Java	C	2	4		4	25														
	D					15														
East Java and Madura	C	8	4	22	8	9	4	3	2			3	1							
	D				1															
Sumatra: Medan	C									3		8		1		3				
	D									2		1		2		4				

Egypt	C	[illegible]		[illegible]				[illegible]			[illegible]								
	D			1	1				1										
Cairo	C						1	1											
Great Britain:																			
England and Wales	C	721	568	508	473	902	233	366	230	212	255	247	275	398	405	370	386	369	369
Birmingham	C		1		1										14	17	11	2	
Bradford	C					11	9	6	2	2	2	2	4	24	6	9	7	2	7
Bristol	C				6	4	2	4	2							2		1	
Cardiff	C					1							1						
Leeds	C	2	5	3	7	5	3	3	6	4	4	6	1		1			2	1
Liverpool	C													1					
London	C														2		1	5	10
Manchester	C				3	6	2	5	10	8		1	2	2	11	6	4	4	1
Newcastle upon Tyne	C	1	1	2	6	9	28	18	5	4	2	13	2	5	14	3	4	6	4
Nottingham	G												7	6	4	8	6	9	6
Sheffield	C	11	2	1	10	6	1	8			3		1	10	4		4		1
Stoke on Trent	C		1										3	1			1		2
Greece: Saloniki	D	1	2																
Guinea (French): Beyla	C	9																	
India	C	11,340	5,911	4,398	3,153	4,052	1,031	1,556	1,939	2,205	2,225	2,502							
	D	3,140	1,668	1,120	715	927	307	359	465	519	515	578							
Bassein	C		1															1	
	D		1																
Bombay	C	38	33	12	10	4		4		5		4	4	6	10	23	10	18	
	D	21	19	8	2	3		1		1					2	8	7	7	
Calcutta	C	93	27	22	5	5	4	3	11	7		17	9	14	14	11	23	10	
	D	70	25		6	2	2	1	6	2		17	4	6	10	7	10	7	
Madras	C	4	6	7	8	7	2	2	5	2	2		11	8	9	16	20	29	
	D	1		2		2	1	1	1		1		4	1	3	2	2	1	
Negapatam	C	3	3	1										5		4	2	2	
	D	2	2	1										3		2	1		
Rangoon	C	37	14	9	17	6	5	2	1	6	36	28	23	49	41	34	103	97	
	D	11	3	2	3	1	1	1		2	5	13	4	9	13	10	18	23	
Vizagapatam	C	11		3									3		2	1	5	2	
	D	4		2											6	1		1	
India (French):																			
Karikal	C	2	3	1	2	P													
	D	2	3	1	2														
Pondicherry	C	22	39	37	38	42	15	6	6	14	6								
	D	20	31	37	38	42	15	6	6	14	6								
Indo-China: Saigon	C	1	1	1						1		1	1	1					
Iraq:																			
Baghdad	C			1		5	1	5	7	12	9	9	3	2					
	D			1	4	4		5	4	5	7	3	2						
Basra	C	1	1	4	2	3		2	2			2							
	D	1	1	4	2	1		2	1			1							
Italy (Rome and vicinity)	C	1		1															
Jamaica (outside Kingston) (alastrim)	C	15	6	9	9	7	1		1	1		2				4			
Kingston	C			3	2														

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3–30, 1927	July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	February, 1928 4	11	18	25
Japan:																				
Nagasaki	C	17	2																	
	D	5	1																	
Tokyo	C														2	1				
	D															1				
Mexico:																				
Acapulco	C			2		1														
	D			2		1														
Chihuahua	D												1							
Guadalajara	D						1			1										
Manzanillo	D													1						
Mexico City and surrounding territory	C						1	1	1	1						1	1			
Monterey	C	6																		
	D	4																		
San Luis Potosi	D	4	1																	
Torreon	D		1		2															
Palestine: Jerusalem	C							1												
Paraguay	D	2																		
Persia: Teheran	D	2																		
Poland	C	7	2							1	5	1								
	D	2	1																	
Portugal:																				
Lisbon	C	4		3	8	4		3	3	4	1	2	4	5	5	2	2			
	D									1										
Oporto	C			1																
Siam	C	34	51	27	6	1		5		1	2	5	8	8	13					
	D	9	10	15						1			2		1					
Bangkok	C	5		3		1		1				1	2							
	D	1		1									1							
Spain:																				
Malaga	D					1	1													
Seville	C													1						
Valencia	C				1						1	1								

Straits Settlements: Singapore	C					1														
Switzerland	C										2									
Tunisia: Tunis	C											2	2			3				
Union of South Africa:																				
Cape Province	C	P	P		P															
Orange Free State	C		P			P	P	P	P	P	P				P					
Transvaal	C				P	7														
Venezuela: Maracaibo	D	1		2	1															

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928		
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31
Algeria	C	376	459	382	682									
Oran	C	14	10	16	11									
Indo-China	C	19	3	21	25	13	3	22	10	4	20		40	18
Syria:														
Aleppo	C										1		1	
Beirut	C								1		1			
Damascus	C		3	5	22		13		4	6	2	11	2	

Place		July	August	September	October	November	December	January
Angola	C	42	2	5	73	71		
	D				2			
Congo	C			5	77			
Cuanza-Norte	C			1				
Cuanza-Sul	C				2			
Loanda	C			1				
Zaire	C			3	4	1		
Brazil: Porto Alegre	C	5	3	3	4	1		
British East Africa: Zanzibar	C				2			
	D				1			
Chosen	C	19	2		2	2		
	D	6				1		
Ecuador, Guayaquil	C		2	2	1	1	4	2
France	C	23	6	8	7	4	14	
Gold Coast	C	1	1	5	4			
Greece	C	3	3	4	4		5	6
Latvia	C				2			
Mexico	D	93	73	55				
Morocco	C	53	76	51	81	140	401	
Nigeria	C	492	91	237	223	93		
	D	83	20	70	51	30		
Persia	D					2		
Spain: Madrid	D					1		
U. S. S. R.:								
Railways, etc	C	11	6	9	7			
Other territories in Europe	C	146	111	199	220			
Transcaucasus, Siberia, and Central Asia	C	36	29	15	40			
Ukraine	C	16	4	7				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11
Algeria:																		
Algiers	C															1		
Oran	C										1	1	1	1		2		
Bulgaria: Sofia	C				17	6				1	1	4	1		1			
	D					1												
Chile:																		
Antofagasta	D	1			1													
Talcahuano	D	1																
Valparaiso	C	2		1		1	1	1						1				
	D		2	1		2												
China:																		
Manchuria—Harbin	C	3	2			1												
Tientsin	C	1		2														
Egypt	C	24	2		12	4	1	7	3	3	1							
	D	1	3		5			5	1	2								
Cairo	C								1	1								
	D								1									
Port Said	C				1			1										
Ireland (Irish Free State):																		
Cork County	C	1							3				1					
Donegal County, Letterkenny	C				4													
Mexico:																		
Guadalajara	D						1											
Mexico City, including municipalities in Federal District	C	16	17	19	18	28	7	6	4		4	4	4	3	2	1		2
	D					2				1	1	3	1					
Morocco	C												107	285	267	214	270	210
Palestine:																		
Haifa	C		4		2	1	1											
Herzliah	C						1											
Jaffa	C		2		1		1											
Nazareth	C	1	2			1												
Safad	C	1	2				1		1									
Tel-Aviv	C		1	1	2	1	1	1	1									

[illegible]	C	99	30	35	19	64	13	23	17	35	26	33	68	68	101	92		
	D	10	6	2	4	11	1	5		4	1	3	6	6	4	3		
Portugal: Oporto	C		1			1												1
Rumania	C	27	36	16	17	22	6	8	8	13	32	17	19					
	D	4	1		2							2	1					
Syria: Aleppo	C			2									2					
Tunisia	C	29	14	1	3	1				1	1			5	4			
Union of South Africa:																		
Cape Province	C	P	P	P	P	P	P	P	P	P	P	1	P		P			
Natal	C	P	P	P	P	P	P	P	1	1	2	P	P	1				
Orange Free State	C	P			P				P									
Transvaal	C	18	1		5	P	P	P										

Place		1927				November, 1927			December, 1927			January, 1928
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10
Algeria	C	67	33	10	12							
	D	13			1							
Algiers	C	2	2	6	2							
Bulgaria	C	12	24	7	2						2	7
	D		1	2	1						1	
Morocco	C	148	76	7	11	5	14	7	5	6	75	
	D											

Place		July	August	September	October	November	December	January
Argentina	C					1		
	D						1	
China: Shanghai	D					1		
Chosen	C	72	17	1	16	26		
	D	8			1	2		
Chemulpo	C	1	2					
Gensan	C	2						
Seoul	C	2	3		2			
	D	1			1			
Czechoslovakia	C	6		6	1		6	
Greece: Athens	C	1		2			1	2
Japan	C	1						
Latvia	C	6						

Place		July	August	September	October	November	December	January
Lithuania	C	44	18	7	9	18	27	
	D	5	8	1	1	1	1	
Mexico	D	12	38	14	36			
Peru:								
Arequipa	D		2	1	2			
Lima	D	8						
U. S. S. R.:								
Railways, etc	C	30	22	25	23			
Transcaucasus, Siberia, and Central Asia	C	79	69	60	61			
Ukraine	C	96	85	114				
Other territories in Europe	C	732	552	555	521			
Yugoslavia	C	11	9		1	1		7
	D	4	1					3

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 29-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927				December, 1927					January, 1928				Feb. 4, 1928
							5	12	19	26	3	10	17	24	31	7	14	21	28	
Ashanti: Obuasi	C		1																	
	D		1																	
Belgian Congo:																				
Boma	C														3					
	D														2					
Matadi	C														6	12	11	1	5	1
	D														2	6	8	2	5	
Dahomey:																				
Grand Popo	C									1										
	D									1										
Porto Novo	C	1																		
	D	1																		
Ivory Coast	C	1												1						
	D	1												1						
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	9	16	6	6	7										
	D	3	9	21	31	8	10	4	4	6										
Dakar	C	1			12	3	6		5	2	1	4			1	1				
	D				7	2	4		4	2	1	4			1	1				
Togoland	C		1																	
	D		1																	

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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SPECIAL ARTICLES

Prevalence of Smallpox in the United States
Studies on the Blacktongue Preventive in Yeast

UNITED STATES
GOVERNMENT PRINTING OFFICE
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1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

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CONTENTS

PUBLIC HEALTH REPORTS

VOL. 43 MARCH 23, 1928 NO. 12

PREVALENCE OF SMALLPOX IN THE UNITED STATES

The reports indicate that smallpox is more prevalent in the United States than it was at this time last year or in 1926. For the week ended March 10, 1928, 42 States reported 1,161 cases of smallpox. For the corresponding week of 1927 these States reported 876 cases, and in 1926 they reported 864 cases for the week.

In 1925 the peak of the smallpox curve was reached about the middle of January; in 1926 the greatest number of cases was reported during the second week of February, and in 1927 the peak came after the middle of March. Some decrease in the incidence of smallpox is to be expected, but health officers should be constantly on the alert.

A FURTHER STUDY OF EXPERIMENTAL BLACKTONGUE WITH SPECIAL REFERENCE TO THE BLACKTONGUE PREVENTIVE IN YEAST

By JOSEPH GOLDBERGER and G. A. WHEELER, *Surgeons*, and R. D. LILLIE and L. M. ROGERS, *Passed Assistant Surgeons, United States Public Health Service*

CONTENTS

In a previous communication, Goldberger and Wheeler (1) presented some of the results of a study of the problem of an experimental animal for pellagra. They reported the production in the dog, by feeding pellagra-producing diets, of a condition considered by them to be identical with a spontaneously occurring canine disease known as blacktongue or Stuttgart dog epizootic. The similarity

of this experimental disease to human pellagra was pointed out, and was considered so striking as to be well-nigh conclusive of the identity of the two conditions. This view was supported, they believed, by the suggestion of a common etiology indicated by the successful production of the condition (blacktongue) in the dog by feeding with pellagra-producing diets. In the present paper we desire to report some further results of the same study.

METHODS

Our methods of housing, caring for, and feeding the experimental animals have been described in a preceding communication (1). It may be noted that the experimental ration was offered each animal once a day and, as a rule, freshly prepared. The amount offered was, in general, all that the dog would eat. At first, to insure this, the attempt was made to offer an excess; but in order to minimize waste this practice was, after a time, modified so that, except for a young growing animal, only enough food for the maintenance of normal body weight was offered. The animals were weighed once a week. It may be here recalled, too, that it has been our practice to use our dogs repeatedly Depending on the purpose of the experiment, the animal was or was not reconditioned by a period of stock diet feeding between successive experiments, for which purpose our stock diet No 156 (1) was the one most frequently used. In what follows, details of this nature will be noted in connection with the presentation of the pertinent parts of the history of each experimental animal. The diagnostic criteria of experimental blacktongue have been presented in a preceding article (1). Here we will say only that the earliest distinctive buccal lesions are a vivid red injection of the floor of the mouth or an erythema of the mucosa of the upper lip in the form of bilaterally symmetrical patches or both.

BLACKTONGUE-PRODUCING POTENCY OF A BASIC EXPERIMENTAL DIET AND OF CERTAIN OF ITS MODIFICATIONS

The composition of the diet with which Goldberger and Wheeler (1) first successfully induced experimental blacktongue is shown in Table 1. This diet was constructed as a somewhat simplified replica of the type of diet found associated with, and, unless suitably supplemented, believed to be responsible for, the occurrence of pellagra. After a number of modifications of the diet shown in Table 1 had been tested, the diet No. 123, shown in Table 2, was constructed and subsequently used as the basic blacktongue-producing diet in many of our experiments. It seems desirable, therefore, to summarize our experience with this (together with certain of its modifications) as a blacktongue-producing diet. This is done in experiments 1, 2, 3, and 4.

Basic Diet No. 123

EXPERIMENT 1

The blacktongue-producing potency of diet No. 123 (Table 2) has been tested in a considerable number of animals and under various conditions. We shall consider here only those tests, however, that were carried out either in animals after a period of reconditioning following a previous experiment and thus presumably in normal condition, or in such as were not previously subjected to experiment and were not known to have ever suffered from blacktongue. Such tests were performed in a total of 14 dogs, the significant details relating to each of which are as follows:

Dog 13.—Male. Acquired April 7, 1923, between which date and November 18, 1926, served in several experiments and suffered seven attacks of experimental blacktongue, the latest of which began July 31, 1925. Was on stock diet No. 156 for reconditioning from November 18 to December 8, 1926.

December 8, 1926: In good condition; weight, 10.1 kilograms; begins test diet No. 123.

On January 25, 1927, at the end of a period of 48 days, noted the first signs of blacktongue,[1] an injection of the floor of the mouth. Weight 9.4 kilograms. Confirmatory evidence of blacktongue noted on February 10, 1927. Course of the attack was remittent or relapsing in character, accompanied by self-imposed partial starvation. Killed with illuminating gas April 28, 1927.

Dog. 14.—Male. Acquired April 7, 1923. Between that date and September 25, 1923, served in two experiments and suffered a relapsing attack of blacktongue beginning May 18, 1923. On stock diet No. 34C, for reconditioning, from September 25 to October 16, 1923.

October 16, 1923: In good condition; weight, 9.3 kilograms; begins test diet No. 123.

On October 30, 1923, at the end of a period of 14 days noted the first signs of blacktongue, an injection of the floor of the mouth and a patch of redness on the mucosa of the upper lip opposite the base of the canine tooth on each side. Weight, 9.2 kilograms. Further history not relevant.

Dog 15.—Male. Acquired April 14, 1923. Between that date and September 25, 1923, served in two experiments and suffered a relapsing attack of blacktongue beginning August 7, 1923. On stock diet No. 34C, for reconditioning, from September 25 to October 16, 1923.

October 16, 1923: In good condition; weight, 9.4 kilograms; begins test diet No. 123.

On October 27, 1923, at the end of a period of 11 days, noted the first signs of blacktongue, an injection of the floor of the mouth and slight reddening of the mucosa of the upper lip. Weight, 9.3 kilograms. Further history not relevant.

Dog 50.—Male. Acquired September 25, 1923. On stock diet No. 34C to October 16, 1923.

October 16, 1923: In good condition; weight, 9 kilograms; begins test diet No. 123.

On October 27, 1923, at the end of a period of 11 days, noted the first signs of blacktongue, a definite reddening of the floor of the mouth. Weight, 8.8 kilograms. Further history not relevant.

[1] The experimental disease has been described in a preceding report (1).

Dog 51.—Bitch. Acquired September 25, 1923. On stock diet No. 34C to October 18, 1923.

October 18, 1923: In good condition; weight, 7.8 kilograms; begins test diet No. 123.

On October 30, 1923, at end of a period of 12 days, noted first signs of blacktongue, an injection of the floor of the mouth. Weight, 7.8 kilograms. Further history not relevant.

Dog 52.—Bitch. Acquired September 25, 1923. On a miscellaneous stock diet to October 22, 1923.

October 22, 1923: In good condition; weight, 8.5 kilograms; begins test diet No. 123.

On November 27, 1923, at the end of a period of 36 days, noted the first signs of blacktongue, an injection of the floor of the mouth. Weight, 8.5 kilograms. Further history not relevant.

Dog 53.—Bitch. Acquired September 25. 1923. On a miscellaneous stock diet to October 22, 1923.

October 22, 1923: In good condition; weight, 5.7 kilograms; begins test diet No. 123.

November 20, 1923: Weight, 5.8 kilograms.

On November 27, 1923, at the end of a period of 36 days, noted the first signs of blacktongue, an injection of the floor of the mouth and of the mucosa of the cheeks. Further history not relevant.

Dog 54.—Bitch. Acquired September 25, 1923. On a miscellaneous stock diet to October 22, 1923.

October 22, 1923: In good condition; weight, 6.2 kilograms; begins test diet No. 123.

On November 28, 1923, at end of a period of 37 days, noted the first signs of blacktongue, an injection of the floor of the mouth. Weight, 6.7 kilograms. Further history not relevant.

Dog 57.—Male. Acquired September 25, 1923. On stock diet No. 34C to October 16, 1923.

October 16, 1923: In good condition; weight, 7.7 kilograms; begins test diet No. 123.

On November 2, 1923, at the end of a period of 17 days, noted the first signs of blacktongue, an injection of the floor of the mouth. Weight, 8.8 kilograms. Further history not relevant.

Dog 58.—Bitch. Acquired September 27, 1923. On stock diet No. 34C to October 16, 1923.

October 16, 1923: In good condition; weight, 13. 5 kilograms; begins test diet No. 123.

On November 1, 1923, at the end of a period of 16 days, noted the first signs of blacktongue, an injection of the floor of the mouth. Weight, 14.3 kilograms. Further history not relevant.

Dog 79.—Bitch. Acquired June 9, 1924. On stock diet No. 156 to December 16, 1924, during which period was bred and whelped a litter of five pups which were successfully weaned.

December 16, 1924: In good condition; weight, 5.3 kilograms; begins test diet No. 123.

January 27, 1925: Weight, 5.5 kilograms.

On February 7, 1925, at the end of a period of 53 days, noted the first signs of blacktongue, a reddening of the floor of the mouth. Weight, 5.4 kilograms. Further history not relevant.

Dog 81.—Male. Acquired October 13, 1924. On stock diet No. 156 to November 21, 1924.

November 21, 1924: In good condition; begins test diet No. 123.

November 25, 1924: Weight, 9.4 kilograms.

On December 27, 1924, at the end of a period of 36 days, noted the first signs of blacktongue, a reddening of the floor of the mouth and of the mucosa of the cheeks. Weight, 10.4 kilograms. Further history not relevant.

Dog 82.—Bitch. Acquired October 13, 1924. On stock diet No. 156 to November 21, 1924.

November 21, 1924: In good condition; weight 10.7 kilograms; begins test diet No. 123.

On December 23, 1924, at the end of a period of 32 days, noted the first signs of blacktongue, reddened bands on mucosa of the upper lip on each side; reddening of mucosa of the cheeks, reddening of the floor of the mouth. Weight 11.5 kilograms.

Treated and used in a study of tomato juice from January 3, 1925, to November 18, 1926, during which period she had an attack of blacktongue beginning March 8, 1925.

On stock diet No. 156 for reconditioning from November 18, 1926, to December 8, 1926. On December 7, 1926, weighed 14.8 kilograms.

December 8, 1926: In good condition; begins a second period of test diet No. 123.

December 14, 1926: Weight, 13.9 kilograms.

January 18, 1927: Weight, 13.9 kilograms.

On January 22, 1927, at the end of a period of 45 days, noted the first signs of blacktongue, reddened patches on mucosa of the upper lip in region of canine teeth of each side; reddening of mucosa of the cheek, and reddening of the floor of the mouth. A rapidly progressive attack, untreated, terminating in death January 29-30, 1927.

Dog 109.—Bitch. Acquired October 29, 1926. On stock diet No. 156 to December 8, 1926.

December 8, 1926: In good condition; weight, 7.1 kilograms; begins diet No. 123.

December 28, 1926: Weight, 7.9 kilograms

On December 30, 1926, at the end of a period of 22 days, noted the first signs of blacktongue, an injection of the floor of the mouth. The attack took a slowly progressive, remittent or relapsing course accompanied by self-imposed partial starvation; untreated, terminated in death April 20, 1927. Weight on day preceding death, 3.3 kilograms.

Thus all 14 of the test animals developed blacktongue, the first distinctive signs of which appeared within not to exceed 53 days after beginning the test diet. Allowed to take its course without therapeutic interference in two of the dogs, it ended in the death of both animals. One of the animals (dog 82) was subjected to the test during two widely separated periods and responded with blacktongue beginning at the end of 32 days in the first and at the end of 45 days in the second period.

Basic Diet No. 209

In diet No. 123 (Table 2) the principal component, quantitatively, is white corn meal, which forms 66 per cent of the weight of the dry ingredients of the ration. Since yellow corn has slightly different dietary properties from the white (richer in vitamin A (2)), it seemed desirable to determine what effect, if any, the substitution in diet

No. 123 of yellow corn meal for the white would have on the blacktongue-producing potency of that diet. Accordingly the following test was made:

EXPERIMENT 2

Six dogs, numbered 44, 52, 60, 63, 64, and 73, were each offered a suitable daily portion of diet No. 209, the composition of which is shown in Table 3. By comparison with Table 2 it may be seen that this differs from diet No. 123 only in that yellow corn meal is used instead of white. The significant facts in relation to each of the test animals are briefly as follows:

Dog 44.—Male. Whelped in the laboratory June 26, 1923. Up to July 17, 1925, served in a number of feeding experiments and suffered two attacks of blacktongue, the latest of which began December 27, 1924. On stock diet No. 156 for reconditioning from July 17, 1925, to August 11, 1925.

August 11, 1925: In good condition; weight, 12.9 kilograms; begins test diet No. 209.

On September 1, 1925, at the end of a period of 21 days, noted the first signs of blacktongue, a reddening of the mucosa of the upper lip and an injection of the floor of the mouth. Weight, 13.3 kilograms. Further history not relevant.

Dog 52.—Bitch. Acquired September 25, 1923. Between that date and July 17, 1925, served in several experiments and had four attacks of blacktongue, the latest of which began March 24, 1925. On stock diet No. 156 for reconditioning from July 17, 1925, to August 11, 1925.

August 11, 1926: In good condition; weight, 10.8 kilograms; begins test diet No. 209.

On October 6, 1926, at the end of a period of 56 days, noted the first signs of blacktongue, an injection of the floor of the mouth. Weight, 9.8 kilograms. Further history nor relevant.

Dog 60.—Male. Whelped in the laboratory November 4, 1923. Up to July 17, 1925, served in a feeding experiment and suffered an attack of blacktongue, which began July 14, 1925. On stock diet No. 156 for reconditioning from July 17, 1925, to August 11, 1925.

August 11, 1925: In good condition; weight, 7.2 kilograms; begins test diet No. 209.

On September 13, 1925, at the end of a period of 33 days, noted the first signs of blacktongue, an injection of the floor of the mouth and a flushing of the mucosa of the cheeks. Weight on September 15, 1925, 7.4 kilograms. Further history not relevant.

Dog 63.—Male. Whelped in the laboratory November 4, 1923. Up to July 17, 1925, served in two experiments and suffered two attacks of blacktongue, the later one of which began March 5, 1925. On stock diet No. 156 for reconditioning from July 17, 1925, to August 11, 1925.

August 11, 1925: In good condition; weight, 7.1 kilograms; begins test diet No. 209.

On August 29, 1925, at the end of a period of 18 days, noted the first signs of blacktongue, a reddening of the floor of the mouth. Weight, 7.5 kilograms Further history not relevant.

Dog 64.—Bitch. Whelped in the laboratory November 4, 1923. Up to July 17, 1925, had suffered one uncertain, but probable, attack of blacktongue

which was in evidence June 27, 1925. On stock diet No. 156 for reconditioning from July 17 to August 11, 1925.

August 11, 1925: In good condition; weight, 6.6 kilograms; begins test diet No. 209.

On September 12, 1925, at the end of a period of 32 days, noted first signs of blacktongue, a reddening of the faucial pillars, the pharynx, and the floor of mouth. Weight, 6.7 kilograms. Further history not relevant.

Dog 73.—Bitch. Acquired March 19, 1924. Up to July 17, 1925, suffered two uncertain, evanescent attacks of blacktongue, the second of which was in evidence July 12, 1925. On stock diet No. 156 for reconditioning from July 17 to August 11, 1925.

August 11, 1925: In good condition; weight, 10.7 kilograms; begins test diet No. 209.

On December 17, 1925, at the end of a period of 128 days, noted the first signs of blacktongue, a reddening of the mucosa of the upper lip and of that of the cheeks. Weight, 8.3 kilograms. Further history not relevant.

All six dogs developed blacktongue, the first distinctive signs of which appeared within not to exceed 56 days after beginning the test diet in five, and at the end of a period of 128 days in one of them.

It would appear, then, that the substitution of yellow for white corn meal made no significant difference in the blacktongue-producing potency of the test diet.

Basic Diet No. 195

In diet No. 123 and its modification, diet No. 209, sodium chloride and calcium carbonate are used to supplement the inorganic, "ash," constituents furnished by the other components of the ration It was thought desirable to determine what effect, if any, on the blacktongue-producing potency of diet No. 123 would be produced by the substitution of a "complete" salt mixture for the sodium chloride and the calcium carbonate. For that purpose experiment 3 was carried out.

EXPERIMENT 3

Five dogs, numbered 9, 29, 83, 84, and 85, were each offered a suitable daily portion of diet No. 195, the composition of which is shown in Table 4. As may be seen by reference to Table 2, this differs from diet No. 123 only in that the well known "complete" salt mixture of Osborne and Mendel (3) replaces the sodium chloride and calcium carbonate of the latter diet. The significant facts in relation to each of the test animals were, in brief, as follows:

Dog 9.—Male. Acquired April 1, 1923, between which date and February 28, 1925, served in a number of experiments and suffered seven attacks of blacktongue, the latest of which began February 24, 1925. On stock diet No. 156 for reconditioning from February 28 to April 1, 1925.

April 1, 1925: In good condition; weight, 12.7 kilograms; begins test diet No. 195.

On May 31, 1925, at the end of a period of 60 days, noted the first signs of blacktongue, a reddening of the mucosa of the upper lip in the region of the canine teeth of each side, and an injection of the floor of the mouth. Weight, 11.4 kilograms. Further history not relevant.

Dog 29.—Male. Acquired May 9, 1923, between which date and February 28, 1925, served in a number of experiments and suffered nine attacks of blacktongue, the latest of which began February 6, 1925. On stock diet No. 156 for reconditioning from February 28, 1925, to April 1, 1925.

April 1, 1925: In good condition; weight, 11.7 kilograms; begins diet No. 195.

On April 17, 1925, at end of a period of 16 days, noted the first signs of blacktongue, a reddening of the mucosa of the upper lip and of the floor of the mouth. Weight, 11.1 kilograms. Further history not relevant.

Dog 83.—Bitch. Acquired February 20, 1925, from which date to April 1, 1925, was on stock diet No. 156.

April 1, 1925: In good condition; weight, 6.8 kilograms; begins test diet No. 195.

On April 18, 1925, at the end of a period of 17 days, noted the first signs of blacktongue, a reddening of the floor of the mouth. Weight, 7.3 kilograms. Further history nor relevant.

Dog 84.—Male. Acquired March 2, 1925, from which date to April 1, 1925, was on stock diet No. 156.

April 1, 1925: In good condition; weight, 7.8 kilograms; begins test diet No. 195.

On April 23, at the end of a period of 22 days, noted the first signs of blacktongue, reddened patches on mucosa of the upper lip opposite the canine teeth of each side. Weight, 9.1 kilograms. Further history not relevant.

Dog 85.—Male. Acquired March 2, 1925, from which date to April 1, 1925, was on stock diet No. 156.

April 1, 1925: In good condition; weight, 6.9 kilograms; begins test diet No. 195.

On April 16, 1925, at the end of a period of 15 days, noted the first signs of blacktongue, reddening of mucosa of the upper lip, of that of the cheeks, and of the floor of the mouth. Weight, 6.8 kilograms. Further history not relevant.

All five test animals developed blacktongue, the first distinctive signs of which appeared within not to exceed 60 days after beginning the test diet.

The substitution of the "complete" salt mixture for the sodium chloride and calcium carbonate of diet No. 123 made, thus, no significant difference in its blacktongue-producing potency.

Basic Diet No. 268

Although diet No. 123 (and its modifications, No. 209 and No. 195) contains a considerable amount of protein, fully one-half of which is from casein, it was thought, nevertheless, that the biological quality of the protein mixture might, perhaps, be improved by increasing the casein component, a view that was strengthened by the results of some growth tests in rats (unpublished). It seemed desirable, therefore, to determine what effect, if any, an increase in the casein component of diet No. 123, and thus, presumably, an improvement in the biological quality of its protein, would have on its blacktongue-producing potency. Experiment 4 was accordingly carried out.

EXPERIMENT 4

Eight dogs, numbered 62, 69, and 101 to 106, inclusive, were each offered a suitable daily portion of diet No. 268, the composition of which is shown in Table 5. As may be seen, this diet differs from No. 123 (Table 2) in containing 50 per cent more casein; it differs from No. 123 also in that it contains a "complete" salt mixture in the place of sodium chloride and calcium carbonate. This experiment may be considered, therefore, as a test of the effect not only of a substantial increase in protein, but also of the use, at the same time, of a complete salt mixture on the blacktongue-producing potency of that diet.

In this connection, it may be stated that this experiment was planned to serve one other purpose—namely, to secure tissues suitable for histopathological study. Believing that diet No. 268 was more nearly complete—at least for maintenance—than No. 123 or its other modifications with respect to all known dietary essentials except the specific factor or factors related to blacktongue,[2] it was thought that animals fed with it when killed at suitable intervals would furnish tissues which might show a sequence of histopathological changes which would thus be relatable to the specific dietary defect.

The significant facts in relation to each of the test animals, except as concerns the histopathology, which will form the subject of a separate report by Dr. James Denton, are briefly as follows:

Dog 62.—Male. Whelped in the laboratory November 4, 1923. Up to May 26, 1926, had one evanescent attack of blacktongue which was in evidence March 24–27, 1925. On stock diet No. 156 May 26 to June 12, 1926.

June 12, 1926: In good condition; weight, 8.8 kilograms; begins test diet No. 268.

On June 26, 1926, at the end of a period of 14 days, killed with illuminating gas for histopathological study. He presented no signs of blacktongue. Weight, 8.6 kilograms.

Dog 69.—Male. Whelped in the laboratory November 25, 1923. Up to May 26, 1926, served in two experiments, but showed no evidence of blacktongue. On stock diet No. 156 from May 26 to June 12, 1926.

June 12, 1926: In good condition; weight, 8.8 kilograms; begins test diet No. 268.

July 27, 1926: Weight, 8.7 kilograms.

July 28, 1926, at the end of a period of 46 days, noted first signs of blacktongue, a slight injection of the floor of the mouth which became more definite on August 6, and on the following day (August 7) there was noted in addition a slight reddening of the mucosa of the cheeks and of the upper lip in the region of the canines.

Animal killed with illuminating gas for histopathological study on August 7, 1926.

Dog 101.—Male. Whelped in the laboratory December 9, 1925, and reared on stock diet No. 156.

[2] The dog does not seem to require the antiscorbutic. It is probable that workers who have reported scorbutic signs in dogs were dealing with some other condition, at times, at least, with blacktongue.

June 12, 1926: In good condition; weight, 7.7 kilograms; begins test diet No. 268.

On July 10, 1926, at the end of a period of 28 days, noted first signs of blacktongue, an injection of the floor of the mouth. Weight, 7.9 kilograms. Attack slowly progressed. Animal killed with illuminating gas for histopathological study on August 7, 1926.

Dog 102.—Male. Whelped in the laboratory December 9, 1925. Reared on stock diet No. 156.

June 12, 1926: In good condition; begins test diet No. 268.

June 15: Weight, 6.10 kilograms.

July 6, 1926: Weight, 6.7 kilograms.

On July 10, 1926, at the end of a period of 28 days, noted first signs of blacktongue, an injection of the floor of the mouth. Attack progressed rapidly. Animal killed with illuminating gas for histopathological study on July 20, 1926.

Dog 103.—Male. Whelped in the laboratory December 9, 1925. Reared on stock diet No. 156.

June 12, 1926: In good condition; begins test diet No. 268,

June 15: Weight, 6.7 kilograms.

July 6, 1926: Weight, 6.4 kilograms.

On July 10, 1926, at the end of a period of 28 days, noted first signs of blacktongue, an injection of the floor of the mouth. Attack was progressive with remissions. Animal killed for histopathological study August 7, 1926.

Dog 104.—Bitch. Whelped in the laboratory December 9, 1925. Reared on stock diet No. 156.

June 12, 1926: In good condition; begins test diet No. 268.

June 15: Weight, 5.7 kilograms.

On July 6, 1926, at the end of a period of 24 days, noted first signs of blacktongue, a reddening of the floor of the mouth, of the faucial pillars, and of the mucosa of the upper lip. Weight, 5.6 kilograms. Animal killed for histopathological study July 10, 1926.

Dog. 105.—Bitch. Whelped in the laboratory December 9, 1925. Reared on stock diet No. 156.

June 12, 1926: In good condition; begins test diet No. 268.

June 15: Weight, 4.9 kilograms.

On July 15, 1926, at the end of a period of 33 days, noted first signs of blacktongue, an injection of the floor of the mouth. Weight, 5.2 kilograms. Attack mild, relapsing. Animal killed August 7, 1926, for histopathological study.

Dog 106.—Bitch. Whelped in the laboratory December 9, 1925. Reared on stock diet No. 156.

June 12, 1926: In good condition; begins test diet No. 268.

June 15: Weight, 4.3 kilograms.

On June 26, 1926, at the end of a period of 14 days, killed for histopathological study. Had presented no signs of blacktongue. Weight, 4.5 kilograms.

Of the eight test animals, two were killed at the end of a test period of 14 days for the purpose of histopathological study. Neither animal had shown any evidence of blacktongue. The period of observation was so brief that these two animals can not properly be considered in appraising the blacktongue-producing potency of the diet. The remaining six animals all developed blacktongue, the first distinctive signs of which appeared within a period of not to exceed 46 days.

It would appear, then, that the modification of diet No. 123 represented by a substantial increase in the protein combined with the

use of "complete" salt mixture was without significant effect on the blacktongue-producing potency of that diet as judged by the attack rate and duration of the feeding period before the appearance of the first distinctive signs of the disease.

In the foregoing series of tests of the pellagra-producing potency of diet No. 123 and its modifications, a total of 33 dogs were used as test animals, and blacktongue was induced in all but two of them. The two that escaped were the two that were killed at the end of a feeding period of 14 days for the purpose of histopathological study. Disregarding these as not having had a full opportunity for the development of the disease, blacktongue was induced in every one of the other 31 test animals. In each of two of these the disease was induced on two separate occasions, so that 33 separate attacks of blacktongue were induced in the 31 animals under consideration in this series of experiments. These 33 attacks developed at the end of feeding periods that varied between 11 and 128 days in duration, but only one of the attacks developed at the end of a period of over 61 days.[3]

THE BLACKTONGUE PREVENTIVE

Dried Brewers' Yeast

It may be recalled that Goldberger and Wheeler's first success in experimentally inducing blacktongue was with a diet that differed from that previously tried without success by Goldberger and Lake in that it included no milk and was not supplemented with yeast (1). The difference in outcome led us to suspect that this might be related to the difference in the diets used. There was already reason to believe that milk possessed pellagra-preventive properties (4) (5) and thus, possibly, also blacktongue-preventive properties; but, as the amount of milk contained in the diet tested by Goldberger and Lake was very small, it seemed improbable that their failure was attributable, at least to an important degree, to the milk. Up to this time we had had no suspicion that yeast might possess pellagra-preventive properties; but in seeking for the explanation of the difference in results under consideration it seemed much more likely that, if Goldberger and Lake's failure was due to the preventive action of either food, this failure was due to the action of the yeast rather than to that of the milk. Reasoning thus, it was decided to test this view; and after some preliminary trials which it seems superfluous to detail, the following experiments were performed:

EXPERIMENT 5

In this test of the blacktongue-preventive action of yeast a commercial dried brewery yeast[4] was used. It was incorporated in

[3] In harmony with this is the additional experience with this basic diet which appears incidentally in connection with some of the experiments with yeast presented in the following section.

[4] Secured from the Harris Laboratories, Tuckahoe, N. Y.

diet No. 155, the composition of which is shown in Table 6, or was fed separately in gelatine capsules as a supplement to basic diet No. 123. Comparing diet No. 155 (Table 6) with diet No. 123 (Table 2) it will be seen that, so far as it is possible to judge, yeast-containing test diet No. 155 differs from basic blacktongue-producing diet No. 123 significantly only in that 5 per cent of the weight of the solids of the former consists of dried yeast.

Five animals, dogs 15, 30, 35, 46, and 50, were used in this experiment. The essential facts pertaining to each of the test animals are presented in the following:

Dog 15.—Male. Acquired April 14, 1923. By reference to experiment 1 it will be seen that this dog developed an attack of blacktongue on diet No. 123, the first signs of which were noted on October 27, 1923. On October 30 treatment was begun by supplementing diet No. 123 with 5.4 grams (approximately 1 per cent of the dry ingredients of diet No. 123) of the dry brewery yeast. Notwithstanding this, however, a relapse of the signs of blacktongue appeared November 24, 1923. Accordingly, on November 26 the amount of yeast theretofore included in diet No. 123 was doubled. On December 27, 1923, a small further increase in the yeast was made, and on March 11, 1924, a still further increase was made which, after slight compensatory adjustment, made diet No. 155.

The evidence of the relapse noted on November 24, 1923, faded in a few days and thereafter to November 21, 1924, the dog continued in good condition without presenting recognizable evidence of blacktongue.

On November 21, 1924, yeast-containing test diet No. 155 was discontinued and basic test diet No. 123 begun.

On December 25, 1924, or 34 days after discontinuing the yeast-containing diet, there were noted the first signs of blacktongue, a reddening of the floor of the mouth. The attack, relapsing and mild, at first slowly progressed and by February 27, 1925, was fully developed and grave. The dog now had a temperature of 40 2° C. On the latter date treatment was begun with a daily dose of 20 grams of yeast in gelatine capsules administered apart from basic diet No. 123, which continued to be offered. The animal began to refuse all food on February 21 and, aside from the yeast supplement in capsules, ate nothing until March 3. Took a little food on the latter date, after which he ate well and the signs of the attack rapidly cleared up. By March 7 virtually all evidence of the attack had disappeared and by the end of the month the dog had recovered his normal weight, 9.8 kilograms.

On March 5, 1925, the daily dose of yeast was reduced to 10 grams. This dose (approximately 1 gram per kilogram of normal body weight) was calculated as about equal to the amount that would be ingested if the yeast-containing test diet No. 155 were offered in the place of basic diet No. 123 which the animal was receiving. Thus supplemented, diet No. 123 was continued to June 19, 1925 (a period of 106 days), without the return of any signs of blacktongue.

Thus dog 15 first recovered from an attack of blacktongue on a yeast-supplemented diet, then, during a period of 255 days while on yeast-containing test diet No. 155, remained in good condition and without any signs of blacktongue. The withdrawal of the yeast-containing diet was followed, at the end of 34 days, by the appearance of the beginning signs of blacktongue which progressed to a grave

attack. Treated with yeast this attack rapidly cleared up and the animal's condition returned to normal and remained so during a further period of 104 days, at the end of which time the experiment was discontinued.

Dog 30.—Male. Acquired August 1, 1923, between which date and October 29, 1923, served in two experiments and suffered two mild attacks of blacktongue. Between October 29, 1923, and March 11, 1924, was subjected to some preliminary tests of yeast.

March 11, 1924: In good condition; weighs 11.4 kilograms; begins test diet No. 155.

February 24, 1925: In good condition; weighs 10.5 kilograms.

On February 28, 1925, diet No. 155 was replaced by diet No. 123, supplemented with a daily dose of 18 grams of yeast separately administered in gelatine capsules. The dose of yeast thus administered was approximately the same as that ingested in the daily ration of diet No. 155, so that diet No. 123 so supplemented was essentially equivalent to diet No. 155.

May 19, 1925: This animal has now for upward of 14 months been on the yeast-containing test diet No. 155 or its equivalent basic diet No. 123 supplemented with yeast. The dog has shown no recognizable evidence of blacktongue at any time during this period. He has been and is in good condition; weighs 10.7 kilograms.

Effective to-day the yeast supplement to basic diet No. 123 is discontinued.

On July 2, 1925, or 44 days after discontinuing the yeast, there were noted the first signs of an attack of blacktongue, erythematous patches on the mucosa of the upper lip in the region of the canine teeth. The further history of this animal belongs to another experiment.

Dog 35.—Bitch. Acquired August 6, 1923, between which date and March 11, 1924, served in a number of experiments including a preliminary test of yeast and suffered three attacks of blacktongue, the latest of which began December 22, 1923.

March 11, 1924: In good condition; weighs 5.8 kilograms. Begins test diet No. 155.

On March 16, 1924, the animal was found to have developed an ulcerative, infective stomatitis. Very little or none of the ration was eaten between March 14 and March 26. Beginning March 20 and thereafter daily until March 26 the dog was given a dose of 12 grams of yeast in gelatine capsules. Beginning March 26 the food consumption began to improve, and by March 30 the ulcerative stomatitis had cleared up.

April 1, 1924: Eating moderately well; mouth is normal in appearance; weighs 5.3 kilograms.

November 21, 1924: In good condition; weighs 6.9 kilograms. Has presented no recognizable evidence of blacktongue during the period of 255 days since beginning yeast-containing diet No. 155.

Effective to-day diet No. 155 is discontinued and basic diet No. 123 is begun.

On December 20, 1924, at the end of a period of 29 days on the basic diet without any yeast, there were noted the first signs of an attack of blacktongue, a reddening of the mucosa of the floor of the mouth and of that of the anterior faucial pillars.

Mild and relapsing at first, the attack slowly progressed and gained in severity. The temperature of the dog was found to have risen somewhat above normal (39.6° C.) on February 20; it reached 40° the next day, and 40.5° on February 22. At this time treatment consisting of the daily administration of 15 grams of yeast,

was begun and was continued to February 25—four days—but without perceptible effect. The dog died of blacktongue February 26, 1925.

Dog 46.—Male. Acquired August 17, 1923, between which date and March 11, 1924, served in a number of experiments including a preliminary test of yeast, and suffered three attacks of blacktongue, the latest of which began February 19, 1924.

March 11, 1924: The signs of the attack of blacktongue which began February 19, 1924, have subsided without treatment. Weighs 5 kilograms. Begins test diet No. 155.

February 28, 1925: In good condition. Has presented no recognizable evidence of blacktongue during the period of 354 days since beginning yeast-containing diet No. 155.

Effective to-day diet No. 155 is discontinued and basic diet No. 123 is begun.

On March 26, 1925, at the end of a period of 26 days, there were noted the first signs of an attack of blacktongue, an erythematous patch on the mucosa of the upper lip on each side in the region of the canine teeth and a reddening of the mucosa of the floor of the mouth.

At first mild and intermittent in its course the attack became progressively more severe and led to the death of the animal on April 28, 1925. Treatment was not attempted.

Dog 50.—Male. Acquired September 25, 1923. Developed an attack of blacktongue which began October 27, 1923, in a test of basic diet No. 123. (See experiment 1.) As a part of a preliminary study, treatment of the attack with yeast was undertaken. It was begun October 29, 1923, and continued with doses increased at intervals up to March 11, 1924. During this period the attack remained mild and relapsing; the latest of the relapses appeared on February 19, 1924, and had subsided by February 25, 1924.

March 11, 1924: Presents no evidence of blacktongue; weighs 10.8 kilograms. Begins yeast-containing test diet No. 155.

February 24, 1925: In good condition; weighs 12.3 kilograms.

February 28, 1925: Diet No. 155 is replaced by basic diet No. 123 supplemented with a daily dose of 14 grams of yeast separately administered in gelatin capsules. This dose of yeast is approximately equal to the amount ingested by this animal in the daily ration of diet No. 155.

May 19, 1925: This animal has now for upward of 14 months been on yeast-containing diet No. 155 or its equivalent, basic diet No. 123 supplemented with yeast. No recognizable evidence of blacktongue has been presented by this dog at any time during this period. Is in good condition; weighs 12 kilograms. Effective to-day the yeast is withdrawn, leaving basic diet No. 123 without supplement.

On June 14, 1925, at the end of a period of 26 days without yeast, there were noted the first signs of an attack of blacktongue, a reddened patch of mucosa on the upper lip in the region of the canine teeth and a reddening of the mucosa of the floor of the mouth. The further history of this dog belongs to another experiment.

It appears, then, that so long as the test animals were fed yeast-containing test diet No. 155, or its equivalent yeast-supplemented diet No. 123 (which was done for 255 days in two, 354 days in one, and 434 days in two), none developed recognizable evidence of blacktongue; but the discontinuance of the yeast was followed within from 26 to 44 days by the appearance of blacktongue in all five of these test animals. Since, as has been shown in the first section of this

communication, the feeding of the foregoing test diet without the yeast (namely, diet No. 123) may be expected to lead to an attack of blacktongue in 100 per cent of cases within a period only very exceptionally longer than about 60 days, it would seem clearly indicated that the yeast had exercised a definite blacktongue-preventive action.

In the course of our preliminary study of the blacktongue-preventive action of yeast we gained the impression that appreciably less of the yeast than that included in test diet No. 155 might be sufficient as a preventive of blacktongue. This impression was subsequently tested, with the result shown in experiment 6.

EXPERIMENT 6

Five dogs, numbered 42, 62, 68, 69, and 76, in good physical condition, were each offered a suitable daily portion of diet No. 123AA, the composition of which is shown in Table 7. By reference to Table 2 it will be seen that diet No. 123AA is basic diet No. 123 to which 11 grams of dried yeast have been added, and that it differs from diet No. 155 (Table 6) essentially only in that it includes somewhat less than one-half the quantity of yeast contained in the latter diet. The significant facts of the experiment relating to each of the test animals are as follows:

Dog 42.—Male. Acquired June 26, 1923. Up to April 11, 1924, served in a number of experiments and suffered three attacks of blacktongue, the latest of which began April 2, 1924. On stock diet No. 156 for reconditioning from April 11 to June 24, 1924.

June 24, 1924: In good condition; weighs 11.9 kilograms. Begins test diet No. 123AA.

May 26, 1925: In good condition; weighs 11.7 kilograms. During the period of 336 days since beginning the test diet has presented no recognizable evidence of blacktongue. The experiment is discontinued

Dog 62.—Male. Whelped in the laboratory November 4, 1923, and reared and maintained on stock diets until June 24, 1924.

June 24, 1924: In good condition; weighs 7.9 kilograms. Begins test diet No. 123AA.

On March 24, 1925, a streaky redness of the mucosa of the floor of the mouth was noted which faded out in the course of the next two or three days. Other than this the animal presented no evidence of blacktongue at any time during the period of the experiment, which terminated May 26, 1925.

Dog 68.—Bitch. Whelped in the laboratory November 25, 1923. Reared and maintained on stock diets until June 24, 1924.

June 24, 1924: In good condition; weighs 8.2 kilograms. Begins test diet No. 123AA.

On September 27, 1924, a small erythematous patch was noted at about the center of the mucosa of the upper lip of each side. This faded within 48 hours. Other than this the animal presented no evidence suggestive of blacktongue at any time during the period of the experiment, which was discontinued May 26, 1925, at the end of 336 days.

Dog 69.—Male. Whelped in the laboratory November 5, 1923. Reared and maintained on stock diets until June 24, 1924.

June 24, 1924: In good condition; weighs 7.7 kilograms. Begins test diet No. 123AA.

On May 26, 1925, at the end of a period of 336 days, the experiment was discontinued. The dog was in good condition and weighed 8.3 kilograms. At no time during the duration of the experiment did he present any evidence of blacktongue.

Dog 76.—Male. Acquired June 9, 1924. Maintained on stock diet until June 24, 1924.

June 24, 1924: In good condition; weighs 8.5 kilograms. Begins test diet No. 123AA.

On May 26, 1925, at the end of a period of 336 days, when the experiment was discontinued, the dog was in good condition; weighed 9.2 kilograms. At no time during the duration of the experiment had this dog presented any recognizable evidence of blacktongue.

Thus of the five dogs fed yeast-containing diet No. 123AA during a period of 336 days—approximately 11 months—two (dogs 62 and 68) presented evanescent signs that may have been and probably were indicative of blacktongue. Since, as has been already shown, the feeding of this test diet without the yeast (that is, diet No. 123) may be expected to induce an attack of blacktongue in 100 per cent of dogs within a period very exceptionally longer than about 60 days, this result would seem to indicate that the small amount of yeast in diet 123AA (11 grams in a 2,400-caloric ration) had exercised a definite, well nigh complete, blacktongue-preventive action.

Yeast Extract Powder

The indication of the blacktongue-preventive action of yeast afforded by the foregoing experience naturally led us to inquire as to what it was in yeast that gave it this property. We began this inquiry with a test of the preventive action of a commercial preparation of what at the outset we were led to believe was the Osborne and Wakeman protein-free yeast fraction II (6), but what later we found to be simply a dried water (acidulated) extract of yeast. The results of this test are presented in experiment 7.

EXPERIMENT 7

The test of the preventive action of what, as has just been stated, proved to be a dried water extract of yeast[5] was carried out in three dogs, numbered 17, 38, and 40, by supplementing basic diet No.123 (Table 2) with a daily dose of the dried extract, as a rule separately administered in gelatin capsules, at the rate of approximately 1 gram per kilogram of body weight. The dosage used was an arbitrary one and, we judge, probably considerably in excess of minimal require-

[5] Marketed under the name "Yeast Vitamine-Harris Powder." One sample analyzed in the division of chemistry of the Hygienic Laboratory was found to contain 7.59, and another 7.14 per cent nitrogen.

ments. The significant details relating to the test in each of the animals are as follows:

Dog 17.—Bitch. Acquired April 14, 1923. Up to July 15, 1924, served in a number of experiments and suffered three attacks of blacktongue, the latest of which began June 14, 1924.

July 15, 1924: The attack of blacktongue, the first signs of which appeared June 14, has progressed and is now well marked and at a stage of moderate severity. There are present the distinctive reddening of the mucosa of the upper lip, of the cheeks, and floor of the mouth, with increase in buccal secretion and a rise in temperature to 39.8° C. Weight is 9.3 kilograms, which is fully 2 kilograms below the normal for this animal. Has eaten nothing in past 48 hours.

This attack, it may be noted, began a few days after beginning basic diet No. 123, but the onset of the attack is related to the immediately preceding experimental diet whose composition is not of interest here. Treatment with 10 grams of the yeast-extract powder is begun this day, supplementing basic diet No. 123.

July 16, 1924: Mouth is necrotic with a foul odor; drooling freely. Given a dose of 5 grams of the extract in solution by drench at 9 a. m. and 6 grams in capsules at 4 p. m.

July 20. 1924: Mouth lesions are improving. Has been receiving 10 grams of yeast-extract powder in capsules daily since July 16. Has taken a small amount of food (diet No. 123) during the past 24 hours.

July 22, 1924: Mouth lesions have practically healed. Has continued the daily dose of 10 grams of the extract. Food consumption has markedly increased during the past 48 hours. Weighs 8.8 kilograms.

July 15, 1925: This animal has now been receiving the yeast-extract powder, 10 grams daily, as a supplement to basic diet No. 123 for one year. When this supplement was begun the animal was suffering an attack of blacktongue of moderate severity. All evidence of this cleared up and no further signs suggestive of the disease have reappeared to date. The animal has thrived on diet No. 123 thus supplemented, and now weighs 13.7 kilograms.

Dog 38.—Male. Whelped in the laboratory June 26, 1923. Up to August 7, 1924, served in a number of experiments and suffered three attacks of blacktongue, a relapse of the latest of which began July 19, 1924.

August 7, 1924: The attack of blacktongue, a relapse of which began July 19, is now at a stage of considerable severity. The stomatitis is marked with salivation and foul buccal odor. The conjunctivæ are injected and there is a mucopurulent ocular discharge with photophobia. Has eaten nothing in two days and the temperature is 40°. The diet on which this attack developed is this day replaced by basic diet No.123 and treatment with a daily dose of 10 grams of dried yeast extract is begun.

August 10: The stomatitis seems better. Buccal odor continues foul, but salivation has diminished. Not eating. A dose of 10 grams of the dried yeast extract has been administered daily.

August 12: The mouth lesions have cleared up, especially those on the lip, the mucosa of which is now well-nigh normal. The eye condition appears to be of the nature of a keratitis and is not much changed. Took some food (diet No. 123) yesterday.

August 19, 1924: Buccal and ocular manifestations have now all cleared up. Eating well. Weighs 9 kilograms. Basic diet No. 123 supplemented with a daily dose of 10 grams of the powdered yeast extract is continued.

August 11, 1925: Has now been on diet No. 123 supplemented with a daily dose of 10 grams of the powdered yeast extract for a year. The animal is in good condition; weighs 11.4 kilograms. Since recovery from the attack at the height of which, on August 7, 1924, treatment was begun, there has been no return of recognizable evidence of blacktongue.

Dog 40.—Male. Whelped in the laboratory June 26, 1923. Up to May 19, 1924, served in a number of experiments and suffered three attacks of blacktongue, of which the latest began April 23, 1924.

May 19, 1924: The attack which began April 23 has now attained a stage of marked severity. The mouth is inflamed; there is an increase in buccal secretion and a foul odor. The temperature at 11 a. m. was 40.1°; at 4 p. m. it was 39.6°.

Treatment with the powdered yeast extract is begun. A solution of 15 grams in tap water is given by drench. The diet on which the attack developed is continued; food consumption is much reduced.

May 20: Condition is not notably changed. Temperature at 10 a. m. is 39.6°; at 3:45 p. m., 40.1°. Weighs 10 kilograms. A solution of 15 grams of the dried extract is given by drench.

May 22: The mouth lesions are better. Has eaten all of the food offered during the past 20 hours. Temperature at 10.10 a. m. 38.7°; at 4 p. m. 38.5°. Receiving 15 grams of the yeast extract in solution daily.

May 29: Mouth is virtually normal. Eating well. Continues the daily dose of the yeast extract which is now stirred into a portion of the food.

July 15, 1924: In good condition. Weighs 11.7 kilograms. Effective this day the diet on which the attack of blacktongue developed is replaced by No. 123, and the dose of the supplement of the powdered yeast extracts is made 12 grams and will henceforth be administered in capsules.

May 26, 1925: This animal is in good condition. Weighs 11.3 kilograms. It has been receiving a daily supplement of the yeast extract for upward of a year. Since recovery from the attack of blacktongue, at the height of which on May 19, 1924, treatment with the yeast extract was begun, there has been no return of recognizable indications of that condition to the present date.

Thus beginning in each of the three dogs with an animal which was severely attacked with blacktongue, the administration of the yeast extract powder was followed by prompt recovery and maintenance in good condition during an experimental period of approximately one year. Considered with the blacktongue-producing potency of basic diet No. 123 in mind, this result would seem clearly to indicate that the dried yeast extract served as an efficient preventive, and thus must have contained much if not all of the blacktongue-preventive factor of the yeast from which it was prepared.

Seidell's Activated Solid

Continuing our inquiry as to what it was in yeast that gave it its blacktongue-preventive action, we turned to the preparation known as Seidell's activated solid. This is a preparation of so-called vitamin B first devised by Seidell in 1916 (7). The method of preparation then proposed was improved by its author in 1922 (8) and, briefly, consists in the adsorption of the vitamins from an acidulated

aqueous extract of fresh brewery yeast by English fuller's earth. We are indebted to Doctor Seidell for a considerable batch of his preparation which we used in the beginning of the following experiment. Most of this study however, was carried out with activated solid prepared by a slight modification of Doctor Seidell's procedure (9). The modification consists essentially in the use of *dried* in the place of *fresh* brewery yeast in making the extract from which the vitamins are adsorbed. The nitrogen content of the activated solid prepared by us was about 2 per cent.

EXPERIMENT 8

The test of Seidell's activated solid was carried out in four dogs, numbered 5, 41, 89, 90. The activated solid was given as a supplement to basic diet No. 123 (Table 2) in a daily preventive dose at the rate of approximately 2 grams per kilogram of normal body weight. Unless otherwise specified, the preparation was given in gelatine capsules (veterinary No. 13) and, for preventive purposes, only once a day. In the few instances in which the study was begun with the treatment of a sick animal, the preparation was at times administered by drench in watery suspension and in broken doses. The significant details relating to each test animal are as follows:

Dog 5.—Bitch. Acquired November 8, 1921. Up to February 18, 1925, served in a number of experiments and suffered four attacks of blacktongue, the latest beginning December 23, 1924. On stock diet No. 156 for reconditioning from January 18 to February 18, 1925.

February 18, 1925: In good condition; weighs 8.7 kilograms. Begins basic diet No. 123 with a supplement of 17 grams of Seidell's activated solid daily.

February 16, 1926: Weighs 8.1 kilograms.

February 18: Has completed one year on diet No. 123 supplemented with Seidell's activated solid. Has presented no recognizable evidence of blacktongue. Is in good condition. Effective to-day the supplement of activated solid is discontinued.

March 9, 1926: Presents this morning, 19 days after the withdrawal of the supplement of activated solid, the first signs of blacktongue, a reddened patch on the mucosa of the upper lip in the region of the canines on each side and an injection of the floor of the mouth. Weighs 7.9 kilograms.

March 29, 1926: The attack of blacktongue, the first signs of which were noted March 9, was allowed to develop without therapeutic interference and ended in death some time last night.

Dog 41.—Bitch. Whelped in the laboratory June 26, 1923. Up to September 8, 1924, had served in a number of experiments and had suffered at least two attacks of blacktongue, the latest of which began August 20, 1924.

September 8, 1924: The attack of blacktongue, the first signs of which appeared on August 20, is now fully developed and of considerable severity. The stomatitis is marked. There is increased buccal secretion and there are bloody liquid stools. The temperature at 10 a. m. was 39.8°; at 2.30 p. m., 39.9°. Has eaten little or nothing during the past six days. Was given by drench, in divided doses, in the course of the day, in all 22 grams of Seidell's activated solid in watery suspension.

September 9: Condition of mouth is not notably changed. Buccal odor is fetid. Bloody evacuations continue. Temperature at 10.30 a. m., 39.7°; at 2.45 p. m., 39.8°. Weighs 7.9 kilograms. The experimental diet on which the attack developed is this day replaced by blacktongue-producing diet No. 123. Not eating. Given by drench, in divided doses, 22 grams of activated solid in watery suspension.

September 13: Very definite improvement in the buccal lesions is now appreciable. Salivation is less marked. Small, bloody, diarrheal stools continue. Temperature at 9.30 a. m., 38.5°. Given 22 grams of activated solid. Not eating.

September 16: Buccal lesions far advanced in healing. Began taking food three days ago and is now eating well. Weighs 7.4 kilograms. Has been getting 22 grams of activated solid daily.

September 19, 1924: Mouth lesions virtually completely healed. Bowel movements formed. Taking 22 grams of Seidell's activated solid daily now stirred into a portion of the ration. Eating well.

September 23, 1924: Eating well. Weighs 8 kilograms.

October 21, 1924: Administration of the activated solid in gelatin capsules begins this day.

January 21, 1925: Has continued in good condition. Eating well. Two days ago, that is on January 19, weighed 10.9 kilograms. Since recovery from the attack of blacktongue, at the height of which treatment was begun, this animal has to date presented no signs of blacktongue. Effective to-day the supply of the batch of activated solid that has been in use (supplied by Doctor Seidell) having become exhausted, a new batch comes into use and the daily dose is reduced to 11 grams, or about 1 gram per kilogram of body weight.

March 3: Weighs 10.8 kilograms.

March 4: Presents this morning, 52 days after the reduction in the daily dose of activated solid, the first signs of an attack of blacktongue, a streaky reddening of the floor of the mouth.

March 10: Weighs 10 kilograms. Food consumption greatly reduced during the past week.

March 11: The signs of blacktongue are now clearly marked but are still mild. As this development suggests that the reduced dose of activated solid is inadequate it is this day doubled, thus again making it 22 grams, which will continue to be administered in gelatin capsules as a supplement to diet No. 123.

March 16, 1925: Erythematous lesions of the mouth have faded completely; mouth is virtually normal in appearance.

March 11, 1926: During the year which has passed since the clearing up of the signs of blacktongue, which were first noted March 4, 1925, the animal has continued in good condition without any further recognizable evidence of the disease. Two days ago weighed 10.8 kilograms. Further history not relevant.

Dog 89.—Bitch. Whelped in the laboratory October 12, 1924. Reared and maintained on stock diet No. 156 to May 26, 1925.

May 26, 1925: In good condition. Weighs 4.3 kilograms. Begins basic diet No. 123 with a daily supplement of 9 grams of Seidell's activated solid in capsules.

October 30: In good conditon. Weighs 4.7 kilograms. The daily dose of activated solid is this day increased to 10 grams to correspond to the increased weight of the dog.

November 11, 1925: Continues in good condition. Weighs 4.6 kilograms. The daily dose of activated solid is reduced to 9 grams.

March 11, 1926: In good condition. Weighs 4.6 kilograms. The test of Seidell's activated solid is this day discontinued. At no time during the experimental period of nine and one-half months has this animal presented any recognizable evidence of blacktongue.

Dog 90.—Male. Whelped in the laboratory October 12, 1924. Reared and maintained on stock diet No. 156 to May 26, 1925.

May 26, 1925: In good condition. Weighs 5.9 kilograms. Begins basic diet No. 123 with a daily supplement of 12 grams of Seidell's activated solid.

July 30, 1925: In good condition. Weighs 6.7 kilograms. The daily dose of activated solid is increased to 13 grams.

March 11, 1926: In good condition. Weighs 6.8 kilograms. The test of activated solid is this day discontinued. At no time during the experimental period of nine and one-half months has this dog presented any recognizable signs of blacktongue.

The experience with Seidell's activated solid detailed in the foregoing experiment would seem clearly to indicate that this fuller's earth preparation of so-called vitamin B in a daily dose of approximately 2 grams per kilogram of body weight exercised a definite blacktongue-preventive action. We may state in this connection that a test of the plain fuller's earth has shown it to be devoid of preventive properties. The preventive action of the activated solid is therefore a property acquired by the fuller's earth in its contact with the aqueous yeast extract, presumably by adsorption.

Yeast Charcoal

Continuing our study of the blacktongue-preventive factor in yeast, we next tested its resistance to heat.

EXPERIMENT 9

Our first test of the effect of heat on the blacktongue-preventive factor in yeast was made with yeast heated to charring—charcoal. Dried brewery yeast from the same source as that used above in experiment 5 was heated in open porcelain dishes over a Bunsen flame until completely charred. One gram of the yeast yielded 0.283 gram of charcoal.[6] This charcoal was ground to a fine powder, packed in gelatine capsules of convenient size, and administered apart from the basic blacktongue-producing diet. Our experience with yeast (experiments 5 and 6) seemed to indicate that when supplementing diet No. 123 or one of its modifications, 1.25 grams per kilogram of body weight would be more than enough for preventive purposes. With this in mind, a daily dose of charcoal representing about 2 grams of the yeast per kilogram of body weight was decided on as a reasonably large therapeutic test dose when treatment is begun early in the attack. This, as will be seen, was deviated from

[6] This determination was kindly made for us by C. G. Remsburg, assistant chemist of the division of chemistry of the Hygienic Laboratory.

in but one of the test animals, which received a dose representing about 1.5 grams of the yeast per kilogram of body weight. The test animals were five dogs, numbered 29, 48, 83, 84, and 85, each in the beginning stage of an attack of blacktongue. Four of these animals had developed the attack on diet No. 195. (See experiment 3.) These were continued on that diet. The fifth animal, dog 48, had developed the attack on a diet of another character which was replaced by diet No. 123 at the outset of the present experiment.

The significant details relating to this test in each of the animals are presented briefly in the following:

Dog 29.—Male. Acquired May 9, 1923. Up to April 24, 1925, served in a number of experiments and suffered several attacks of blacktongue, the latest of which began April 17, 1925. Weight on April 21 was 11 kilograms.

April 24, 1925: The beginning buccal erythema of an attack of blacktongue noted a week ago has faded during the past two days. The diet (No. 195) on which the attack developed continues to be offered. Effective to-day, the daily administration of 6.7 grams of yeast charcoal representing approximately 27 grams, or over 2 grams per kilogram of body weight, of the yeast from which prepared, is begun.

April 25: Mucosa of upper lip and that of the floor of the mouth are again reddened.

April 28: Food consumption is at a reduced rate. Weighs 10.8 kilograms. The daily administration of 6.7 grams of yeast charcoal has been continued.

April 29: In addition to the reddening of the upper lip and of the floor of the mouth, the mucosa of the cheeks is now reddened.

May 1: Tends to regurgitate or vomit the capsules of charcoal; with a view of preventing this, some of the food will from now on be forcibly fed in conjunction with the charcoal.

May 5: The buccal lesions have become more pronounced. There is now a patch of superficial necrosis on the mucosa of the left cheek. Weighs 10.4 kilograms. Temperature is 38.6°.

May 12: Weight is 9.4 kilograms.

May 19: The buccal lesions which had become fairly marked have greatly improved during the past three or four days during which food consumption has been excellent. Weighs 9.7 kilograms.

May 25: During the past four days the mouth lesions have flared up again and are quite well marked to-day. The yeast charcoal in a daily dose of 6.7 grams has been regularly administered since April 24. No beneficial effect being appreciable, the charcoal is this day replaced by a daily dose of 22 grams of some of the same yeast as that from which the charcoal was prepared.

June 4: During the past four days the buccal lesions, which had become quite well marked, have rapidly improved so that to-day the condition of the mouth is virtually normal.

June 18: Eating well and gaining in weight. Two days ago weighed 11.1 kilograms. No further evidence of blacktongue. Effective to-day the daily dose of brewery yeast which has been 22 grams is reduced to 10 grams, or somewhat less than 1 gram per kilogram of body weight.

August 11: In good condition. Weighs 11.7 kilograms. Has been receiving the daily dose of 10 grams of brewery yeast for 54 days. Has presented no recognizable evidence of blacktongue since recovery from the attack the treatment of which with yeast charcoal had been without appreciable effect. Further history is not relevant.

Dog 48.—Bitch. Acquired August 20, 1923. Up to March 11, 1925, served in a number of experiments and suffered three attacks of blacktongue, the latest of which began March 10, 1925. Weight on March 10, 1925, was 6.2 kilograms.

March 11, 1925: Presents beginning buccal signs of an attack of blacktongue. The diet on which the attack developed is this day replaced by basic diet No. 123 and treatment is begun with a daily dose of 2 grams of yeast charcoal representing approximately 7 grams of the dried brewery yeast (or 1 gram of yeast per kilogram of body weight).

March 16: The buccal lesions after becoming more pronounced have receded slightly during the past 24 or 48 hours. No appreciable effect from the charcoal having been noted, the daily dose is this day increased to 4 grams, representing approximately 14 grams of the yeast from which prepared (corresponding to over 2 grams of yeast per kilogram of body weight).

March 17: Weighs 6.1 kilograms.

April 7: Mouth lesions of blacktongue have gone through alternating periods of recession and relapse. Eating very poorly. Weighs 5.2 kilograms. The condition is becoming complicated by self-imposed semistarvation. The charcoal is being continued.

May 16: Food refusals have become more and more pronounced. Weight has fallen off progressively. The buccal signs of blacktongue have persisted in mild degree. Moribund this morning; chloroformed. No benefit from the charcoal could be appreciated.

Dog 83.—Bitch. Acquired February 20, 1925. Served as one of the test animals of diet No. 195 (experiment 3) and developed an attack of blacktongue beginning April 18, 1925. Weight April 21, 7.5 kilograms.

April 22, 1925: The buccal signs of blacktongue are now quite definite but mild. Continues on diet No. 195. Begins treatment with a daily dose of 4 grams of yeast charcoal, representing approximately 14 grams of the yeast from which prepared and corresponding to nearly 2 grams of yeast per kilogram of body weight.

April 28: The blacktongue lesions have become somewhat more pronounced. Weighs 7.3 kilograms. The treatment with charcoal is being continued.

May 2: Buccal lesions have well-nigh completely faded. To minimize a recently developed tendency to vomit the capsules of charcoal, about 100 grams of food (diet No. 195) will, beginning this day, be forcibly fed in conjunction with the charcoal.

May 8: Lesions of blacktongue have gradually reappeared during the past two or three days.

May 16: Buccal lesions are more marked and show a superficial necrotic process. Temperature has risen to 39°.

May 17: Mouth lesions have become severe. Temperature at 10 a. m., 39.7°; at 3.30 p. m., 40.4°. Has been getting the charcoal daily without any appreciable effect. The attack now being grave, charcoal is this day replaced by 6 grams of brewery yeast.

May 21: A dose of 12 grams of yeast was administered on May 18, May 19, and May 20. That of May 20 was not retained. Found dead this morning.

Dog 84.—Male. Acquired March 2, 1925. Served as one of the test animals of diet No. 195 (experiment 3) and developed an attack of blacktongue, the first signs of which appeared on April 23.

April 23, 1925: Presents beginning signs of blacktongue, a slight reddening of the floor of the mouth and a faintly reddened patch on the mucosa of the upper lip in the region of the canines. Weighs 9.1 kilograms. Treatment is this day begun with a daily dose of 4 grams of yeast charcoal, corresponding to approximately 14 grams of the brewery yeast from which it is prepared and representing 1.5 grams of yeast per kilogram of body weight.

May 2: Mouth is normal except for faintly reddened patches on the upper lip. The administration of the charcoal continues, but a small amount (about 100 grams) of the basic diet is forcibly fed in conjunction with the charcoal to minimize a tendency to reject the charcoal.

May 23: During the month, since the treatment with charcoal commenced, the buccal signs of blacktongue have alternately receded and flared up. They are more pronounced this morning than at any time since first appearing. Food consumption has been at a progressively reduced rate. Weight four days ago was 8.5 kilograms.

There being no appreciable tendency to improvement, but, if anything, the contrary, the treatment with charcoal is this day discontinued and the daily administration of 12 grams of dried brewery yeast is begun.

May 26: Mouth lesions have cleared up. Weight is 8.3 kilograms.

August 11: In good condition. There has been no reappearance of any recognizable evidence of blacktongue. Has been receiving 12 grams of yeast daily. Weight has steadily increased and is 10 kilograms to-day. Further history not relevant.

Dog 85.—Male. Acquired March 2, 1925. Served as one of the test animals of diet No. 195 (experiment 3) and developed an attack of blacktongue beginning April 16, 1925: On April 14 weighed 5.4 kilograms.

April 16, 1925: Presents the first buccal signs of an attack of blacktongue. Begins treatment with a daily dose of 4 grams of yeast charcoal corresponding to approximately 14 grams of the yeast from which it is prepared and representing approximately 2.5 grams of yeast per kilogram of body weight.

May 2: After a gradual subsidence of the mouth lesions so that the appearance of the mouth was about normal on April 27, they reappeared on April 28 and are now more pronounced than at any time since their first appearance. There has appeared a tendency for the dog to reject the capsules of charcoal, so effective yesterday, a small amount of food is to be forcibly fed daily in conjunction with the charcoal.

August 9: The buccal lesions of blacktongue have repeatedly subsided and flared up during the past three months. They are now again well marked. Food consumption has fallen off and the weight has declined to 3.3 kilograms. Seems much emaciated and in poor general condition.

There being thus no appreciable tendency to recovery although the yeast charcoal has been daily administered, this treatment is this day discontinued and treatment with dried yeast is this day begun. A dose of 8 grams is administered to-day.

August 20: Mouth lesions have completely cleared up. Has received a daily dose of 4 grams of yeast since August 10 but because the food taking which at first improved has declined in the past three days, the dose of yeast is this day increased to 6 grams. On August 18 weighed 2.9 kilograms.

August 23: It being administratively inconvenient to continue to prepare diet No. 195, it is this day replaced with No. 123. The dose of 6 grams of yeast is continued. There is no recognizable evidence of black tongue.

September 29: Has presented no return of any recognizable evidence of blacktongue since the clearing up of the mouth lesions following the change to treatment with the yeast. Food consumption has been excellent and there has been a steady gain in weight during the past five weeks. Weight to-day is 5.8 kilograms. Further history not relevant.

Thus, in none of the five test animals was there any curative or arresting effect appreciable from the treatment with yeast heated to charring (charcoal), even though this was begun very early in or at the very onset of the attack, a failure that is all the more significant by reason of the favorable effect of treatment with the yeast itself subsequent to the failure of the charcoal treatment in three of four of the animals in which it was tried. It may be noted, too, that the dose of the yeast was relatively no greater or, indeed, was relatively less, than that of the charcoal. In the animal in which the yeast itself seemingly failed, this treatment was inaugurated at an advanced stage of the attack three days before the animal died—that is, at a stage when the chances of cure by any treatment may be expected to be greatly reduced. It would appear, therefore, that the effective factor in the brewery yeast was inactivated or destroyed by the charring heat.

P-P Activated Fuller's Earth (P-P Solid)

EXPERIMENT 10

Our next test of the effect of heat on the blacktongue-preventive factor in yeast was carried out with yeast heated in the steam autoclave for two and one-half hours at 15 pounds pressure, or, rather, with a fuller's earth preparation activated by treatment with an acidulated aqueous extract of such autoclaved yeast. The yeast was a grain medium grown, low temperature dried bakers' yeast.[7] In autoclaving, this yeast was put into glass petri dishes having a diameter of about 120 mm. and a depth of about 15 mm., and then the dishes, uncovered, were arranged on a series of screen shelves in the autoclave. On withdrawing from the autoclave the yeast was permitted to dry, after which it was ground to a powder sufficiently fine to pass a 40-mesh sieve. Next, 10 pounds of this powdered autoclaved yeast were stirred into 25 liters of tepid water containing 2.5 c. c. of glacial acetic acid (USP) and allowed to extract with repeated stirring for not less than one and one-half hours. This was then passed through a Sharples supercentrifuge four times, discarding the insoluble matter deposited in the bowl. Into the resulting effluent there were stirred 750 grams of English fuller's earth previously sifted through a 60-mesh sieve. This was kept agitated for about one hour and then the fuller's earth was separated by passing the suspension, first diluted with about an equal volume of distilled water, rapidly through the centrifuge.

[7] For which we are indebted to the Fleischmann Yeast Co., New York City.

This earth, from which the soft puttylike portion was separated and discarded, was dried in a current of warm air, then ground to pass a 60-mesh sieve. Nitrogen content of this fuller's earth preparation to which we shall refer as P–P solid (9) is about 1 per cent.

The test dose of this P–P solid was the same as that of Seidell's activated solid in experiment 8—namely, 2 grams per kilogram of body weight. It was administered in gelatin capsules once a day as a supplement to basic blacktongue-producing diet No. 123. The test animals were five dogs, numbered 15, 40, 52, 59, and 88. The significant details relating to each of these animals are briefly as follows:

Dog 15.—Male. Acquired April 14, 1923. Up to December 17, 1925, served in a number of experiments and suffered four attacks of blacktongue, the latest of which began December 25, 1924. Between February 28 and December 17, 1925, was on basic diet No. 123 supplemented with dried yeast.

December 17, 1925: In good condition. Weighs 9.6 kilograms. Continues basic diet No. 123 and begins a daily supplement of 20 grams of P–P solid, or at the rate of approximately 2 grams per kilogram of body weight.

December 21, 1926: Has completed one year on diet No. 123 supplemented with a daily dose of 20 grams of P–P solid. Has been in good condition throughout this period. Weight has varied between 9 and 10 kilograms. Now weighs 9.5 kilograms. Further history not relevant.

Dog 40.—Male. Whelped in the laboratory June 26, 1923. Up to December 17, 1925, served in a number of experiments and suffered three attacks of blacktongue, the latest of which began April 23, 1924. Between May 26 and December 17, 1925, on diet No. 123 supplemented with dried yeast.

December 17, 1925: In good condition. Weighs 11 kilograms. Continues basic diet No. 123 and begins a daily supplement of 22 grams of P–P solid, or at the rate of 2 grams per kilogram of body weight.

December 21, 1926: Has completed one year on diet No. 123 supplemented with 22 grams of P–P solid. Has been in good condition throughout, at no time presenting any recognizable evidence of blacktongue. Weighs 11 kilograms. Further history not relevant.

Dog 52.—Bitch. Acquired September 25, 1923. Up to December 17, 1925, served in a number of experiments and suffered several attacks of blacktongue, the latest of which began October 6, 1925. On stock diet No. 156 for reconditioning from December 7 to December 17, 1925.

December 17, 1925: Convalescing from the recent sharp attack of black tongue. Two days ago weighed 7 kilograms, whereas normally weighs about 10 kilograms. Begins diet No. 123 with a daily supplement of 20 grams of P–P solid, or at the rate of 2 grams per kilogram of normal body weight.

December 21, 1926: Has completed one year on diet No. 123 supplemented with a daily dose of 20 grams of P–P solid. General condition, which was poor at first, gradually improved with gain in weight. Now weighs 10. 5 kilograms. Has presented no recognizable evidence of blacktongue.

Dog 59.—Bitch. Whelped in the laboratory November 4, 1923. Reared and maintained on stock diets to February 2, 1926.

February 2, 1926: Has just weaned a litter of seven pups. Is in good condition. Weighs 5. 2 kilograms. Begins basic diet No. 123 supplemented with a daily dose of 11 grams of P–P solid, or at the rate of approximately 2 grams per kilogram of body weight.

February 2, 1927: Has completed a year on the P–P solid supplemented blacktongue-producing diet without presenting any recognizable evidence of blacktongue. Has been in good condition throughout. Weighs 5.5 kilograms.

Dog 88.—Male. Whelped in the laboratory October 12, 1924. Reared on stock diet. Up to February 2, 1926, served in one experiment and suffered an attack of blacktongue which began December 18, 1925. On stock diet No. 156 for reconditioning from December 21, 1925, to February 2, 1926.

February 2, 1926: In good condition. Weighs 5.4 kilograms. Begins basic diet No. 123 with a daily supplement of 10 grams of P–P solid.

February 2, 1927: Has completed one year on the P–P solid supplemented blacktongue-producing diet; in good condition. Has not presented any recognizable evidence of black tongue. Weighs 5.2 kilograms. Further history not relevant.

With the blacktongue-producing potency of basic diet No. 123 in mind (see experiment 1) it is clear that the P–P solid supplement has exercised complete preventive action. It follows, therefore, that the autoclaved yeast, the aqueous extract of which was used to activate the fuller's earth in the preparation of the P–P solid, retained much, if not all, of the blacktongue-preventive property of the yeast from which it was prepared. The effective factor in yeast is thus largely, if not completely, resistant to the heat of the steam autoclave at 15 pounds pressure and two and one-half hours' exposure and, under the conditions stated, is adsorbed by English fuller's earth.

Seven and One-half Hour Autoclaved Yeast

EXPERIMENT 11

This was another test of the effect of heat on the blacktongue-preventive factor in yeast. Dried bakers' yeast was exposed to the heat of the steam autoclave at 15 pounds pressure for a period three times as long as that in experiment 10—namely, seven and one-half hours. Some of this autoclaved yeast was incorporated in a diet, No. 223A, the composition of which is shown in Table 8. This diet, as may be seen by reference to Table 6, is diet No. 155, the dried brewers' yeast of which is quantitatively replaced by the 7½-hour autoclaved bakers' yeast. Test diet No. 223A was offered in suitable calorie portions to each of 5 test animals, dogs 29, 38, 84, 85, and 97. The significant details relating to each of these animals are briefly as follows:

Dog 29.—Male. Acquired May 10, 1923. Up to March 11, 1926, served in a number of experiments and suffered several attacks of blacktongue, the latest of which began April 17, 1925.

March 11, 1926: Has been receiving yeast in some form since May 25, 1925. Is in good condition. Weighed 11.7 kilograms two days ago. Begins test diet No. 223A.

March 15, 1927: In good condition. Weighs 9 kilograms. Has been receiving diet No. 223A for one year, during which period he has not presented any recognizable evidence of blacktongue.

Dog 38.—Male. Whelped in the laboratory June 26, 1923. Up to March 11, 1926, served in a number of experiments and suffered several attacks of blacktongue, a relapse of the latest of which began July 19, 1924.

March 11, 1926: Has been receiving yeast in some form since August 11, 1925. Is in good condition. Weighed 12.1 kilograms two days ago. Begins test diet No. 223A.

March 15, 1927: In good condition. Weighs 11.4 kilograms. Has been receiving diet No. 223A for one year, during which period he has presented no recognizable evidence of blacktongue.

Dog 84.—Male. Acquired March 2, 1925. Up to March 11, 1926, suffered one attack of experimental blacktongue which began April 23, 1925.

March 11, 1926: Has been receiving yeast in some form since May 23, 1925. Is in good condition Two days ago weighed 10.4 kilograms. Begins test diet No. 223A.

March 15, 1927: In good condition. Weighs 10 kilograms. Has been receiving diet No. 223A for one year but has presented no recognizable evidence of blacktongue during that period.

Dog 85.—Male. Acquired March 2, 1925. Up to March 11, 1926, suffered one attack of experimental blacktongue which began April 16, 1925.

March 11, 1926: Has been receiving yeast in some form since August 9, 1925. Is in good condition. Two days ago weight was 7.1 kilograms. Begins test diet No. 223A.

March 15, 1927: In good condition. Weighs 7 kilograms. Has been receiving diet No. 223A for one year but has presented no recognizable evidence of blacktongue during that period.

Dog 97.—Male. Acquired January 18, 1926, when about 9 weeks old and maintained on stock diet No. 156 to March 11, 1926

March 11, 1926: In good condition. Weight two days ago was 6 kilograms. Begins test diet No. 223A.

May 4, 1926: Permanent teeth have now replaced all of the milk teeth. Growth has continued. Weighs 8.5 kilograms.

March 15, 1927: Has been receiving diet No. 223A for one year. Has presented no recognizable evidence of blacktongue. Continued growth during the year. Is in good condition. Weighs 10 kilograms.

Thus, none of the five dogs developed any recognizable evidence of blacktongue during an experimental period of one year. Since test diet No. 223A differs from blacktongue-producing diet No. 123 significantly only in that the former includes some autoclaved yeast, the blacktongue-preventive action of diet No. 223A must be attributed to this yeast. It would follow, therefore, that the blacktongue-preventive factor in the yeast retained much if not all of its activity in spite of an exposure to the heat of a steam autoclave at 15 pounds pressure for seven and one-half hours.

IDENTITY OF THE BLACKTONGUE PREVENTIVE

Consideration of the results yielded, first, by the experiments with blacktongue-producing diet No. 123 and its modifications—diets No. 209, No. 195, and No. 268—and, second, by the series of experiments with yeast, leads unavoidably to the conclusion that

experimental blacktongue is due to a deficiency in diet and that yeast contains something that is capable of correcting this deficiency. It is pertinent now to inquire into the relation of this blacktongue-preventing substance in yeast to the commonly recognized dietary essentials.

Of the known dietary factors there are present in yeast in significant amount (10) only inorganic elements or "ash," protein of good biological quality, the antineuritic or vitamin F,[8] the heat-stable substance of Smith and Hendrick (11) and the pellagra-preventive (P–P) of Goldberger and Tanner (12) (13).

That the blacktongue-preventive in yeast is not the "ash" would seem to be indicated by the fact, first, that blacktongue-producing diets No. 195 and No. 268 contain what would seem to be a liberal quota of the well known "complete" salt mixture of Osborne and Mendel (3), and, second, that charred yeast, containing the ash of the yeast, when administered in what would seem to be a liberal dosage as a supplement to diet No. 195 (which, as just remarked, already includes a "complete" salt mixture) failed, as herein above shown, to reveal any evidence of a beneficial therapeutic action.

Turning to protein as possibly the effective factor we find that blacktongue-producing diet No. 268 (Table 5) includes what would seem to be a liberal amount of protein, considerably more and doubtless of a better quality than that of diet No. 123. This is likewise true of the protein of diet No. 281 (Table 9) which, as will be shown in experiment 12, when supplemented with an antineuritic preparation is also blacktongue producing. Yet, as has been seen, when diet No. 123 is supplemented with our fuller's earth activated preparation—P–P solid—which contains but about 1 per cent of nitrogen and, thus, it would seem, can at best supply but a relatively negligible amount of protein, the deficiency is corrected and blacktongue is prevented. It would seem permissible, therefore, to exclude the protein factor from consideration in the present connection.

The evidence that the effective blacktongue factor in yeast is distinct from the antineuritic vitamin is, if anything, more convincing than is the evidence just considered, that it is not identical with either the "ash" or the protein. Aside from other considerations their nonidentity is, we believe, conclusively shown by the effectiveness as a blacktongue-preventive of autoclaved yeast which, as we have elsewhere (13) already shown by tests in rats, contains but an insignificant amount, if any, of the antineuritic vitamin. Futher evidence of this as well as of the separateness of the blacktongue-preventive and protein is afforded by the results of experiment 12.

[8] Yeast both bakers' and brewers'—may vary considerably in its content of this factor. (Unpublished data.)

EXPERIMENT 12

Each of four dogs, numbered 71, 76, 86, and 87, were offered daily suitable calorie portions of diet No. 281 (Table 9). In addition, dogs 71 and 76 were given daily a supplement of our P–P solid (see experiment 10) in gelatine capsules at the rate of 2 grams per kilogram of body weight, while dogs 86 and 87 received daily a supplement of an antineuritic preparation—corn solid No. 3 [9]—at the rate of 1.25 grams per kilogram of body weight. The significant details relating to each test animal are presented in the following:

Dog 71.—Male. Whelped in the laboratory November 25, 1923. Reared on stock diets and up to October 28, 1926, served in a number of experiments and suffered an attack of blacktongue which began September 9, 1926. On stock diet No. 156 for reconditioning from October 28, 1926, to December 8, 1926. On December 7, 1926, weighed 10.3 kilograms.

December 8, 1926: In good condition. Begins diet No. 281 with a daily supplement of 21 grams of our P–P solid, separately administered in gelatine capsules.

December 21: Has been eating well. Weighs 10.4 kilograms.

December 28: Food consumption considerably diminished during the past four days. Weighs 10 kilograms.

January 4, 1927: Food consumption has continued much reduced. Weighs 8.9 kilograms.

January 11: Has taken very little food during the past week. Weighs 8 kilograms. Is much emaciated.

January 15: Eating very little. Hind legs seem weak; walks unsteadily.

January 16: Hind limbs appear stiff in walking. Knee reflex is active.

January 17: Found this morning in a semisprawling posture. During the day had repeated convulsive seizures of a tetanic type with fore legs thrust stiffly forward, hind legs semiflexed and head retracted. Mucosa of mouth normal except for some bruising of the upper lip. Temperature (rectal) at 1.25 p. m., 30.5° C. The animal has an attack which is quite like that of the "polyneuritis" frequently observed in rats on similar diets.

January 18, 1927: Died some time during the night.

Dog 76.—Male. Acquired June 9, 1924. Up to October 28, 1926, suffered one attack of blacktongue which began September 4, 1926 On stock diet No. 156 for reconditioning from October 28, 1926, to December 8, 1926. On December 7, 1926, weighed 9.7 kilograms.

December 8, 1926: In good condition. Begins diet No. 281 with a daily supplement of 21 grams of our P–P solid separately administered in gelatine capsules.

January 27, 1927: Up to December 21, 1926, food consumption was excellent. Thereafter it declined and the weight fell off. The weight two days ago was 6.8 kilograms. The 21 grams of P–P solid has been administered daily. This morning appears much emaciated and weak. In walking, hind legs seem stiff. Knee reflex present. Later in the day it became clear that this dog had "polyneuritis."

[9] This was prepared as follows: After preparing an alcoholic extract of whole corn meal as elsewhere (13) described, there was added to the extract of each 5 kilograms of corn meal 125 grams of English fuller's earth. This was then stirred for two hours, after which it was allowed to stand over night. Then the supernatant alcoholic liquor was decanted and replaced by about 2 liters of fresh 85 per cent alcohol, after which it was vigorously stirred and then allowed to settle over night. The next day the alcohol was decanted and replaced with fresh 85 per cent alcohol. After stirring, this was again allowed to stand over night, when the procedure was repeated. After the third washing the fuller's earth was transferred to a paper filter, on which it was dried in a few hours in a current of warm air. This dried activated fuller's earth, our corn solid, was then ground to pass a 60-mesh sieve and stored for use.

January 29: Down this morning, sprawling on abdomen with hind limbs abducted and flexed, fore limbs thrust forward. Tetanic spasms at intervals, but without marked opisthotonos. Mucosa of mouth normal except for traumatic patches on upper lip.

Killed with illuminating gas when seen to be dying. Ate almost nothing during last week of life.

Dog 86.—Bitch. Whelped in the laboratory October 12, 1925 Reared on stock diets. Up to October 28, 1926, suffered two doubtful attacks of blacktongue, evidence of the latter of which was present between October 25 and October 28, 1926. On stock diet No. 156 for reconditioning from October 28 1926, to December 8, 1926. On December 7, 1926 weighed 9.6 kilograms.

December 8, 1926: In good condition. Begins diet No. 281 and a daily supplement of 12 grams of our antineuritic preparation—corn solid No. 3—administered separately in gelatine capsules.

On January 8, 1927, presented a suspicious injection of the floor of the mouth which faded out two days later to reappear on January 23. On January 24 there was present on the mucosa of the upper lip of each side a faintly reddened, broken band with a more marked reddening of the floor of the mouth, constituting evidence of a mild beginning blacktongue. No signs of polyneuritis. Further history not relevant.

Dog 87.—Bitch. Acquired October 12, 1924. Up to October 28, 1926, suffered one attack of blacktongue which began September 28, 1926. On stock diet No. 156 from October 28, 1926, to December 8, 1926. On December 7, 1926, weighed 5 6 kilograms.

December 8, 1926: In good condition. Begins diet No. 281 with a daily supplement of 7 grams of corn solid No 3 separately administered in gelatine capsules.

January 24, 1927· Presents first signs of a beginning blacktongue, a reddened band on the mucosa of each cheek, reddening of the floor of the mouth and of faucial pillars The dose of 7 grams of corn solid has been regularly administered. No evidence of polyneuritis. Further history not relevant.

Thus the two dogs that received the supplement of our blacktongue-preventive preparation—P-P solid—but no known antineuritic, developed the signs of an antineuritic deficiency at the end of 39 and 50 days, respectively, but no evidence of blacktongue. In contrast, the two dogs that received the supplement of our antineuritic preparation—corn solid No. 3—but no blacktongue preventive, both developed evidence of blacktongue, one at the end of 31 days and the second at the end of 47 days, without any signs of polyneuritis during the specified periods nor, we may add, during considerably longer additional periods of observation.

These results confirm and strengthen the evidence above cited indicating that the blacktongue preventive and the antineuritic factor are separate and distinct.[10]

Thus, by a process of exclusion, we come finally to the question of the relation of the blacktongue preventive to the yeast-contained thermostable factor of Smith and Hendrick (11), and to the pellagra preventive or vitamin P-P (12) (13).

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[10] It may be remarked, in passing, that for growth of the young rat some of both preparations must be included in a "synthetic" diet that is complete for growth excepting only the so-called vitamin B In the absence of either, even though the other be included in liberal amounts, the young rat will not grow (9).

With respect to its relation to the factor of Smith and Hendrick we may at once state that, on the basis of the available evidence (11) (13), which need not here be reviewed, the two are indistinguishable. As concerns its relation to the pellagra preventive, we have elsewhere (13) already briefly discussed this question and provisionally concluded that they were identical. Confining ourselves at this time, however, to a consideration of the evidence bearing on this question afforded by the results of the experiments recorded in the present communication alone, we have as a basis for judgment only the fact that the black-tongue preventive like the pellagra preventive is present in yeast. This association is suggestive, but, of course, by itself is far from conclusive of their identity. Taken in conjunction with the striking clinical similarity of blacktongue and pellagra, elsewhere discussed (1), and the suggestion of a common etiology indicated by the successful experimental production of the disease in the dog by feeding with a pellagra-producing diet (1), it increases somewhat the probability that blacktongue and pellagra are fundamentally identical conditions, and thus that the blacktongue preventive and the pellagra preventive, or vitamin P–P, are identical. Further evidence bearing on the question of this identity, to some of which we have elsewhere (13) already briefly referred, will be presented and considered in another communication.

SUMMARY AND CONCLUSIONS

The blacktongue-producing potency of a basic experimental diet and of three modifications was tested 33 times in 31 dogs with the production of 33 separate attacks of blacktongue. Only one of these attacks developed at the end of a period longer than 61 days.

Experimental blacktongue is due to a dietary deficiency which is capable of being corrected by something contained in yeast.

This something, or blacktongue preventive, in yeast is inactivated or destroyed by heat sufficient to char the yeast; retains its preventive potency in large measure, if not entirely, after heating in the steam autoclave at a pressure of 15 pounds for seven and one-half hours; and is adsorbed from an acidulated aqueous extract of either dried yeast or of yeast first autoclaved at a pressure of 15 pounds for two and one-half hours by English fuller's earth. It can not be identified with any of the older well-recognized dietary essentials, but is believed to be identical with the thermostable substance of Smith and Hendrick.

The blacktongue preventive and the pellagra preventive are both present in yeast. Taken in conjunction with certain other evidence pointing to the fundamental identity of blacktongue and pellagra, this association strengthens the probability that the blacktongue preventive and the pellagra preventive, or vitamin P–P, are identical.

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TABLE 1.—*Composition of experimental blacktongue-producing diet No. 34,*[1] *a simplified replica of the type of diet associated with pellagra*

[Total calories, 1,620]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal (white commercial, unbolted)	200.0	15.0	8.4	131.8
Farina (Quaker brand)	57.0	6.3	.8	43.5
Rice (white)	28.0	2.2	.1	22.1
Cowpeas (*Vigna sinensis*)[2]	14.0	3.0	.2	8.5
Lard	21.0		21.0	
Cod-liver oil	9.5		9.5	
Cottonseed oil	18.5		18.5	
Calcium carbonate	3.0			
Sodium chloride	10.0			
Gelatine	46.0	42.0		
Tomato juice[3]	115.0			
Total nutrients		68.5	58.5	205.9
Nutrients per 1,000 calories		42.3	36.1	127.1

[1] The corn meal, farina, rice, cowpeas (previously coarsely ground), lard, and sodium chloride are stirred into a suitable amount of tap water and then cooked in a double boiler of enamel ware for about an hour and a half. At the end of this period the cooking is discontinued, the remaining ingredients are well stirred in, and the final weight of the mixture is brought to 2,000 grams by the addition of tap water with thorough stirring. 1 gram of the cooked ration represents approximately 0.8 calorie.

[2] The variety known as the California black-eyed pea.

[3] Pressed from canned tomatoes.

TABLE 2.—*Composition of experimental blacktongue-producing diet No. 128*[1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal[2]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*)[3]	50	10.7	.7	30.4
Casein (purified)[4]	60	52.0		
Sucrose	32			32.0
Cottonseed oil	30		30.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		96.3	64.5	358.4
Nutrients per 1,000 calories		40.1	26.9	149.3

[1] The corn meal, cowpeas (previously coarsely ground), and salt are stirred into water and cooked in a double boiler of enamel ware for about 1½ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents 1 calorie), and this finished mixture is served to the dog ad libitum.

[2] Whole maize meal (white) sifted as for human consumption.

[3] The variety known as the California black-eyed pea.

[4] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (14).

TABLE 3.—*Composition of experimental blacktongue-producing diet No. 209,*[1] *a modification of diet No. 123 (Table 2), from which it differs in containing yellow*[2] *in the place of white corn meal*

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal (yellow)[2]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*)[3]	50	10.7	.7	30.4
Casein (purified)[4]	60	52.0		
Sucrose	32			32.0
Cottonseed oil	30		30.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		96.3	64.5	358.4
Nutrients per 1,000 calories		40.1	26.9	149.3

[1] The corn meal, cowpeas (previously coarsely ground), and salt are stirred into water and cooked in a double boiler of enamel ware for about 1½ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents 1 calorie), and this finished mixture is served to the dog ad libitum.

[2] Whole maize meal (yellow) sifted as for human consumption.

[3] The variety known as the California black-eyed pea.

[4] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (14).

TABLE 4.—*Composition of experimental blacktongue-producing diet No. 195,*[1] *a modification of diet No. 123 (Table 2) from which it differs in having a "complete" salt mixture in the place of sodium chloride and calcium carbonate*

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal[2]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*)[3]	50	10.7	.7	30.4
Casein (purified)[4]	60	52.0		
Sucrose	32			32.0
Cottonseed oil	30		30.0	
Cod-liver oil	15		15.0	
Salt mixture[5]	22			
Total nutrients		96.3	64.5	358.4
Nutrients per 1,000 calories		40.1	26.9	149.3

[1] The corn meal and cowpeas (previously coarsely ground) are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents 1 calorie), and the finished mixture is served to the dog ad libitum.

[2] Whole maize meal (white) sifted as for human consumption.

[3] The variety known as the California black-eyed pea.

[4] Commercial casein, leached for a week in daily changes of acidulated water, after McCollum (14).

[5] After Osborne and Mendel (3).

TABLE 5.—*Composition of experimental blacktongue-producing diet No. 268,*[1] *a modification of diet No. 123 (Table 2) from which it differs in containing more protein (casein) at the expense of the carbohydrate (sucrose) and a "complete" salt mixture in the place of the sodium chloride and calcium carbonate*

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal [2]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*) [3]	50	10.7	.7	30.4
Casein (purified) [4]	95	82.6	.5	
Cottonseed oil	30		30.0	
Cod-liver oil	15		15.0	
Salt mixture [5]	22			
Total nutrients		126.9	65.0	326.4
Nutrients per 1,000 calories		52.9	27.0	136.0

[1] The corn meal and cowpeas (previously coarsely ground) are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents 1 calorie), and the finished mixture served to the dog ad libitum.
[2] Whole maize meal (white) sifted as for human consumption.
[3] The variety known as the California black-eyed pea.
[4] Commercial casein leached for 1 week in daily changes of acidulated water, after McCollum (14).
[5] After Osborne and Mendel (3).

TABLE 6.—*Composition of diet No. 155.*[1] *This is blacktongue-preventing. (It differs from blacktongue-producing diet No. 123 (Table 2) significantly only in that it contains some yeast)*

[Total calories, 2,450]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Brewers' yeast [2]	30	12.5	.4	14.2
Corn meal [3]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*) [4]	47	10.1	.7	28.6
Casein (purified) [5]	54	46.8		
Cottonseed oil	41		41.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		103.0	75.9	338.8
Nutrients per 1,000 calories		42.1	30.6	138.3

[1] The corn meal, cowpeas (previously coarsely ground), and salt are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents approximately 1 calorie), and the finished mixture is served to the dog ad libitum.
[2] A commercial dried brewery yeast.
[3] Whole maize meal (white) sifted as for human consumption.
[4] The variety known as the California black-eyed pea.
[5] Commercial casein leached for 1 week in daily changes of acidulated water, after McCollum (14).

TABLE 7.—*Composition of diet No. 123AA.*[1] *This is diet No. 123 (Table 2) to which 11 grams of dried yeast have been added. (Unlike diet No. 123, however, this has well-nigh, if not quite, complete blacktongue-preventive action)*

[Total calories, 2,440]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Brewer's yeast [2]	11	4.5		5.2
Corn meal [3]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*) [4]	50	10.7	.7	30.4
Casein (purified) [5]	60	52.0		
Sucrose	32			32.0
Cottonseed oil	30		30.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		100.8	64.5	363.6
Nutrients per 1,000 calories		41.3	26.4	149.0

[1] The cornmeal, cowpeas (previously coarsely ground), and salt are stirred into water and cooked 1½ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents approximately 1 calorie), and the finished mixture is served to the dog ad libitum.
[2] A commercial dried brewery yeast.
[3] Whole maize meal (white) sifted as for human consumption.
[4] The variety known as the California black-eyed pea.
[5] Commercial casein leached 1 week in daily changes of acidulated water, after McCollum (14).

TABLE 8.—*Composition of diet No. 223A.*[1] *(This, like diet No. 155 (Table 6), from which it differs only in the character of the yeast component, is blacktongue preventive)*

[Total calories, 2,445]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Autoclaved baker's yeast [2]	30	9.0	0.8	15.6
Corn meal [3]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*) [4]	47	10.1	.7	28.6
Casein (purified) [5]	54	46.8		
Cottonseed oil	41		41.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		99.5	76.3	340.2
Nutrients per 1,000 calories		40.6	31.1	138.8

[1] The corn meal, cowpeas (previously coarsely ground), and salt are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents approximately 1 calorie), and the finished mixture is served to the dog ad libitum.
[2] Dried baker's yeast, autoclaved at 15 pounds pressure for 7½ hours.
[3] Whole maize meal (white) sifted as for human consumption.
[4] The variety known as the California black-eyed pea.
[5] Commercial casein leached 1 week in daily changes of acidulated water, after McCollum (14).

TABLE 9.—*Composition of diet No. 281.*[1] *(For rats this "synthetic" diet is complete for growth except for the so-called vitamin B which is virtually completely lacking. Fed to dogs with a supplement of a preparation of the blacktongue preventive, it brings about polyneuritis. When supplemented with an antineuritic preparation, it leads to blacktongue)*

[Total calories, 2,380]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Casein (purified) [2]	150	130.0	0.7	
Cottonseed oil	48		48.0	
Cod-liver oil	12		12.0	
Cornstarch	366			329.0
Salt mixture [3]	24			
Total nutrients		130.0	60.7	329.0
Nutrients per 1,000 calories		54.6	25.5	138.2

[1] One-fifth of the starch is stirred into ten times its weight of water and cooked about ½ hour. Into the resulting jelly the remaining ingredients are stirred in the following order: Salt mixture, cottonseed oil, cod-liver oil, and the remaining starch previously mixed with the casein. The final weight is brought to 1,600 grams with water (so that 1 gram of the finished mixture represents approximately 1.5 calories). Served to dogs ad libitum.

[2] Commercial casein leached 1 week in daily changes of acidulated water, after McCollum (14).

[3] After Osborne and Mendel (3).

DEATH RATES IN A GROUP OF INSURED PERSONS

RATES FOR PRINCIPAL CAUSES OF DEATH, JANUARY, 1928

The accompanying table is taken from the Statistical Bulletin for February, 1928, issued by the Metropolitan Life Insurance Co., and presents the mortality experience of the industrial insurance department of the company, by principal causes of death, for January, 1928, as compared with January, 1927, and December, 1927. The rates are based on a strength of approximately 18,000,000 insured persons in the United States and Canada.

The death rate for January in this group of persons was 9.4 per 1,000, as compared with 9.3 for January, 1927, and with 8.7 for December, 1927.

Among the epidemic diseases of childhood, measles, scarlet fever, and diphtheria registered slightly higher rates than in January a year ago. The small increases in the rates for measles and scarlet fever are unimportant, as the rates for both years are low; but some significance attaches to the increase in the rate for diphtheria, since this disease, after registering a continuous decline for five years, showed an increase in 1927. The rates for the early months this year will therefore be watched with considerable interest.

Increased death rates as compared with January, 1927, are also shown for many of the diseases of greatest numerical importance, e. g., tuberculosis, cancer, diabetes, and the three principal "degenerative" diseases—heart disease, cerebral hemorrhage, and chronic

nephritis. The mortality from pneumonia, however, declined appreciably, and that from influenza declined slightly.

The automobile fatality situation not only fails to improve but continues to grow worse. Following the rise in mortality from automobile accidents in 1927 to the highest figure ever recorded for this group of persons, January registered the unprecedented death rate for that month of 16.1 per 100,000. The former maximum rate for January was 13.6 per 100,000, for January, 1926.

Death rates (annual basis) for principal causes per 100,000, January, 1928, as compared with January, 1927, and December, 1927

[Industrial department, Metropolitan Life Insurance Co.]

Cause of death	Rate per 100,000 lives exposed [1]			
	January 1928	December 1927	January 1927	Year 1927 [2]
Total, all causes	944.9	866.0	928.2	885.4
Typhoid fever	1.8	2.8	2.4	4.6
Measles	3.8	2.0	3.6	4.1
Scarlet fever	3.6	2.5	3.0	3.1
Whooping cough	4.3	3.7	6.9	6.4
Diphtheria	14.8	14.3	13.6	10.5
Influenza	25.4	17.7	26.1	17.7
Tuberculosis:				
All forms	84.8	84.0	80.2	93.3
Of respiratory system	74.2	74.1	69.2	81.7
Cancer	74.3	73.0	72.7	74.0
Diabetes mellitus	19.0	18.1	17.1	16.7
Cerebral hemorrhage	59.4	56.0	57.8	54.9
Organic diseases of heart	150.7	135.3	146.5	132.2
Pneumonia (all forms)	111.2	83.5	118.5	77.6
Other respiratory diseases	18.9	16.4	14.9	15.4
Diarrhea and enteritis	13.0	16.1	14.1	24.5
Bright's disease (chronic nephritis)	79.4	65.7	72.3	69.3
Puerperal state	13.7	12.3	13.8	15.4
Suicides	7.4	7.2	7.6	8.3
Homicides	6.2	6.6	5.8	7.2
Other external causes (excluding suicides and homicides)	62.4	59.9	61.8	63.7
Traumatism by automobiles	16.1	16.5	12.8	18.3
All other causes	190.9	189.0	189.5	186.7

[1] All figures include infants insured under 1 year of age.
[2] Based on provisional estimate of lives exposed to risk in 1927.

COURT DECISION RELATING TO PUBLIC HEALTH [1]

Action against physician for alleged negligence in smallpox case.—(Ohio Supreme Court; Jones *v.* Stanko, Administratrix; decided January 25, 1928.) An action was brought by the defendant in error, a widow, against the plaintiff in error, a physician, to recover damages for the death of her husband, alleged to have been caused by the physician's negligence. The facts, as stated by the court, were as follows:

* * * The death of one Alexander Thompson, a neighbor of Stanko [the deceased husband], was caused by black smallpox. Dr. Jones was the sole

[1] The abstract of this decision was prepared from a copy of the decision furnished by Mr. James E. Bauman, assistant director of health of Ohio.

attending physician. He was called on Tuesday and saw the patient, Thompson, every day, and sometimes oftener than once a day, until Saturday of the same week, upon which day the patient died. It is alleged, and the evidence tends to sustain the allegation, that Mr. Stanko inquired of Dr. Jones whether Mr. Thompson was suffering from any contagious disease, and Dr. Jones assured him that Thompson was not suffering from any contagious disease, and that he, Stanko, took no risk from contagion by waiting upon Mr. Thompson in his illness. By reason of these assurances from Dr. Jones, Mr. Stanko not only waited upon Thompson prior to his death, but performed certain services with reference to his preparation for burial after death. The neighbors were in and out, doing what little they could in a friendly way to relieve the suffering of Mr. Thompson, and none of them were conscious of the fact that he was suffering from a disease that was extremely contagious, as well as infectious, to wit, black smallpox. There is no doubt that Thompson had black smallpox, and that he died as a result of that disease. It is not at all in dispute that Dr. Jones failed entirely to announce to anyone during the period mentioned that Thompson was suffering from black smallpox or any other contagious disease. It is admitted in the record that Dr. Jones failed entirely to notify the health authorities, as required by statute, of the fact that he was then treating Mr. Thompson for a contagious disease.

In the trial court a jury returned a verdict in favor of the physician. On appeal by the widow to the court of appeals, she assigned, among other errors, the refusal of the trial court to give certain requested instructions to the jury. One of the requests was, in part, as follows:

And if you also find from the preponderance of the evidence in this case that said defendant, Washington L. Jones, was the sole physician treating said Alexander Thompson during his sickness from March 17, 1925, to March 21, 1925, inclusive, and that the fact that the said Alexander Thompson was then and there suffering from the disease of smallpox would have been known to a physician possessing the requisite qualifications and applying his skill and judgment with ordinary care and diligence to the diagnosis of the said disease, it was made under such facts, if so found by you, by the provisions of the statute, just quoted, the duty of the physician in charge of said Alexander Thompson to report said disease to the health officer within whose jurisdiction such person is found, and if you further find that said defendant failed to comply with said provisions of said statute and that such failure to comply with said provisions of the statute was the proximate cause of the death of the decedent, Stephen Stanko, as by plaintiff alleged in her second amended petition herein, your verdict must be for the plaintiff.

The other requests related to the duty of the physician to discover and to make known the character of disease that his patient was suffering from, and embraced the same statement in reference to the necessary qualifications of the physician that was contained in the above-quoted request. The court of appeals reversed the trial court's judgment solely on the refusal to give the requested instructions, and the physician appealed to the supreme court. The latter court affirmed the judgment of the court of appeals, stating in part as follows:

* * * The contention of plaintiff in error is that these requests were wrong in speaking of the qualifications of the attending physician in the terms "a physician possessing the requisite qualifications," etc.

It is said that the court should have instructed the jury, in view of the evidence in the case, that Dr. Jones was only required to have the ordinary skill possessed by general practitioners in medicine in the locality of his home, and that he was not required to possess the "requisite qualifications" to diagnose and discover a case of black smallpox such as that with which Thompson died.

* * * * * * *

The only thing in dispute here is whether Dr. Jones was negligent in not discovering that this was a case of black smallpox, and in failing to give notice thereof to the public health officials and to those who were coming into the presence of Thompson and in contact with him.

We can not sustain the construction placed by counsel for Dr. Jones upon the requests to charge. The language was not intended to say, and did not say, that Dr. Jones must possess expert skill in diagnosing beyond that possessed by other doctors in general practice in that locality, or such degree of skill as insured accuracy in all cases. Counsel for Dr. Jones claim that this, in effect at least, is what these requests did say and hence the trial court was correct in refusing to give them.

We think the language used in the requests only referred to the knowledge and skill possessed by physicians in general practice, as distinguished from the knowledge and statements of laymen present, who might venture opinions on the subject with respect to which no one would be entitled to rely for his own safety. The instruction to the jury was that, in order to find Dr. Jones liable, they must find that he was one holding himself out as a general practitioner of medicine.

The law requires a man who engages in the general practice of the medical profession to be one who has educated himself to take care of the matters incident to such practice, and one of the things that he must be held to know is whether he is dealing with a disease which is dangerously contagious. If it were a defense for such practicing physician, who had failed to discover and give due notice of the presence of such a disease, to say that he had not theretofore treated a disease of that kind, and had not observed symptoms such as the patient involved manifested, the escape from the provisions of the statute would surely be marvelously easy.

It will be noted that in each one of the requests, after speaking of a physician "possessing the requisite qualifications," the request gives the degree of care that must be exercised, by stating that it must be ordinary care and skill. A physician is not the insurer of his patient, but his patient has the right to believe that one holding himself out as qualified to practice medicine has the requisite skill to deal with that subject, and when so dealing, he must exercise ordinary skill and care relative to the matter in hand. It is that, and no more, that is required by those requests numbers 11, 12, and 15, and we quite agree with the court of appeals that this language does not present reversible error in this case. Aside from the feature of the requests mentioned—a physician possessing the requisite qualifications—it is not seriously contended that these requests are erroneous. The requests as presented should have been given, and the failure to give them was clearly error prejudicial to the plaintiff in the trial court. * * *

PUBLIC HEALTH ENGINEERING ABSTRACTS

Chloro-Phenol Tastes Pervade Chicago Water Supply. Anon. *Engineering News-Record*, vol. 100, No. 3, January 19, 1928, pp. 115–116. (Abstract by W. M. Olson.)

This is a summary of particulars concerning the bad taste of Chicago's water supply during the latter part of December, compiled from a report by Doctor Bundesen, of the Sanitary District of Chicago, and from other sources.

"One of the worst periods of taste-producing pollution of water by industrial wastes at the southern end of Lake Michigan occurred December 23–30, 1927, when the water supply of Chicago and of the Indiana cities of Gary, East Chicago, Whiting, and Hammond, farther south, was rendered undrinkable. This condition affected more than 3,000,000 people, as well as numerous industries using city water in the manufacture of edible products."

The taste-producing elements were phenol and cresol compounds of chlorine caused by the reaction between tarry acid wastes from by-product coke plants and chlorine used for disinfecting the water supplies. "The amount of phenol pollution was very great, being about 60 parts per billion."

Results of investigations of the source and motion of the wastes are summarized. Prompt and efficient chlorination control measures by the municipal division of water safety control are noted. "The absorption of chlorine by the industrial wastes and sewage was exceptionally heavy and made it necessary to use relatively large quantities of this chemical to assure a safe water based on residual chlorine control." A maximum chlorine dosage of 13.6 pounds per million gallons was carried for one hour.

"Bacterial analyses of special samples collected during the emergency indicated serious contamination by sewage organisms. The chlorinated water samples, however, showed that the dangerous pollutional organisms were killed."

The Practical Utility of Bacteriologic Control of Water Supplies. Ivan C. Hall. *Journal American Water Works Association*, vol. 19, No. 1, January, 1928, pp. 69–77. (Abstract by W. L. Havens.)

Early evidence that such diseases as typhoid fever, the paratyphoids, the dysenteries, and cholera were frequently transmitted by drinking water naturally led to the hope that the detection of such bacteria in water would serve as a criterion of its potability. However, it is very rare that these organisms can be isolated directly from naturally polluted water supplies, for the reasons that (1) the relative number of these organisms is small in proportion to nonpathogenic forms, (2) their persistence in water is transitory, and (3) they lack distinguishing characteristics from the harmless species naturally present. The sanitarian has therefore become mainly interested in discovering criteria of pollution rather than in the detection and isolation of specific disease-producing organisms. These criteria may be based upon either chemical tests for chlorides, the presence of nitrogeneous compounds, or a high oxygen demand. The more direct criteria of pollution are bacterial.

Total agar plate counts may be of practical significance in determining relative amounts of pollution, in indicating the efficiency of a purification process, and in controlling the bacterial content of swimming pools. Extreme care must be used in interpreting the results of various presumptive tests for *Bact. coli* since other organisms, such as *Bact. aerogenes*, may produce similar reactions. Having identified the presence of *Bact. coli*, which may be of either human or other animal origin, it can only be assumed that the water is potentially dangerous and precautions should be taken before it is used as a source of supply. Bacterial tests must therefore be interpreted with extreme caution unless they are used for indicative purposes only.

Manganese Interference in the Orthotolidine Test for Available Chlorine. Edward S. Hopkins. Ind. Eng. Chem., vol. 19, pp. 744–6, 1927. Abstract by Edward S. Hopkins in the *Journal American Water Works Association,* vol. 18, No. 6, December, 1927, p. 763.

"Attention is called to the fact that unstable salts of manganese will oxidize orthotolidine and produce the characteristic yellow color. Entire reliance can not be placed upon this test for available chlorine if manganese is present in a water supply. The possible chemical formulae for manganese under such conditions are discussed."

Water Purity and Fish Life. W. Rushton. *The Surveyor,* vol. 72, No. 1872, December 9, 1927, p. 574. (Abstract by H. W. Streeter.)

The care taken to preserve river water for drinking purposes and the lack of attention to preserving the natual fauna and flora when the waters are required for other purposes are the main subjects of the paper.

Pure water will not support fish life, because of the absence of a suitable food supply. Also, if certain ingredients are absent, diseases, including goiter, will appear among fish. If rivers must receive effluents from various works they should not destroy the natural fish life or permit foreign growths killing natural ones.

Comparing the fish food value of water works filter beds and impounding reservoirs, slow sand filters are shown to be good places for rearing fish, but reservoirs are often deficient in fish food.

Evidence exists that waters from producer gas plants harm small streams, owing to presence of sulphur compounds and carbon monoxide in solution. Effluents from coal-washing plants and coke ovens are known to harm river waters for fish life.

Report on Electrolux Water Softener. Anon. *Journal of State Medicine of Royal Institute of Public Health,* vol. 36, No. 1, January, 1928, pp. 49–50. (Abstract by H. V. Pedersen.)

The electrolux softener used in the experiment consisted of a tinned-copper cylinder 1 foot, 8 inches high and 5 inches in diameter, containing a special kind of earth treated in a particular manner, but composed mainly of alumina and silica. Periodically the softening material must be regenerated with dissolved common salt.

The conclusions arrived at from the experiments are as follows: "(1) By analysis it is found that all the hardness is removed from the water; (2) that no deleterious ingredient could be detected in the softened water; (3) that this method of water softening is very simple, economical, and efficacious."

The Correlation Between Differential Tests for Colon Bacteria and Sanitary Quality of Water. I. M. Lewis and E. E. Pittman. *Journal American Water Works Association,* vol. 19, No. 1, January, 1928, pp. 78–92. (Abstract by W. L. Havens.)

This article describes the several methods which have been proposed for the differentiation of fecal from nonfecal colon bacteria and gives the practical limitations of the various methods, particularly in an effort to determine which of them correlates best with the sanitary quality of the water. The supplies under consideration were obtained from deep fissure springs located along the Balcones escarpment from Austin, Texas, to Del Rio. The conclusion drawn is that the citrate test is more easily and quickly applied than the methyl red and Voges-Proskauer reactions and has been shown to correlate better with the sanitary quality of the water.

The Microscopy of Drinking Water. A review by W. C. Purdy. *Journal American Water Works Association,* vol. 19, No. 1, January, 1928, pp. 93–94. (Abstract by W. L. Havens.)

This article is a review of the fourth edition of "The Microscopy of Drinking Water," by George Chandler Whipple, as revised by Gordon M. Fair and Melville C. Whipple. The new book contains much new material and is divided into two sections, one dealing with applied microscopy and the other with determinative microscopy. The essence of the book is to determine the meaning of the presence of microscopic organisms in water and the interpretation which the sanitary engineer may safely place upon his biological findings.

Laws and Regulations for Protection of Public Water Supplies. W. J. Scott. *Water Works*, vol. 65, No. 10, October, 1926, pp. 479–484. (Abstract by Harriet S. Ryan.)

This is a review of outstanding features in the water-supply conditions in New England, given in a paper presented September 15 at the forty-fifth annual convention of New England Water Works Association.

The topography and natural water resources in New England make it necessary to use but very few water supplies at the present time which can be considered sewage polluted. General conditions are such that chlorination can be regarded as a factor of safety rather than an integral part of necessary purification processes. The absence of water filtration plants and dependence mainly upon clean watersheds and storage, necessitate legal methods of protection against dangerous watershed conditions.

The existing laws and regulations are classified under ten headings, and the status of conditions is discussed under these headings. There is a wide variation in legal methods of protection of public water supplies where no great dissimilarity exists in conditions. It is shown in the discussion that the repealing of some statutes and the adoption of others would aid considerably in furnishing safe water. The immediate charge of water supplies can properly be in the hands of local officials, but the statutes should place the supervision of public water supplies under the State department of health and no new source or no change in existing sources should be constructed without the approval of that department. The statute should place with the State department of health the authority to order owners of waterworks to undertake necessary changes, with proper provisions for appeal and for financing the necessary improvements. The legislation of Ohio is quoted. The provision in the Massachusetts law, making the granting of permits discretionary with the department of public health, seems satisfactory. There should be statutory authority to take land for watershed protection by right of eminent domain, with provision for equitable settlement. The Connecticut statute concerning the construction of a reservoir near a cemetery should be amended. The Massachusetts statute, which prohibits new cemeteries on watersheds without approval State, seems desirable. The manner of cross connections should be left to the discretion of the State department of health. The Massachusetts procedure for setting up the machinery for cities and towns for emergencies is worthy of consideration.

The First Year's Operation of the Providence, R. I., Filtration Plant. Julius W. Bugbee and Elwood L. Beam. *The American City*, vol. 37, No. 6, December, 1927, pp. 731–736. (Abstract by J. B. Harrington.)

This article describes the new Scituate project of the Providence, R. I., water supply and its operation for the first year. The new project consists of a hydroelectric plant, a 37,000,000,000 gallon impounding reservoir, an influent aerator, a head house for storage and application of coagulants, a rotary mixer, two coagulating basins of 31,000,000 gallons and 94,000,000 gallons capacity, respectively, 10 rapid sand filters with a capacity of 48,000,000 gallons a day, an effluent aerator, and a chemical storage house.

The plant was placed in operation on September 30, 1926. The results obtained by varying the chemical dosage, by increasing the retention period in

the coagulating basins, by adjusting the aerators, and by changing the length and rate of filter wash are all described briefly. Bacteriological results indicate that the raw water is practically free from *B. coli* and that the final effluent is consistently negative.

Quantitative Studies of Phenols in Water Supply. W. Donaldson and R. W. Furman. *Journal American Water Works Association*, vol. 18, No. 5, November, 1927, pp. 605–620. (Abstract by C. R. Cox.)

Recent water supply studies in Toledo, Ohio, included the analyses of industrial wastes containing phenolic compounds and also a critical review of the results secured by various workers in estimating the amount of phenol in waters and in detecting the intensity of tastes produced by phenolic compounds. It was found that the Folin-Denis reagent is sensitive to 0.02 p. p. m. phenol, cresol, cresylic acid mixture, and wood creosote, and that the Fox and Gauge reagent is sensitive to 0.01 p. p. m. phenol and cresol and to 0.02 p. p. m. cresylic acid and wood creosote. It was found in the distillation of 250 c. c. portions of the samples that only 85 per cent of pure phenol was recovered in three 50 c. c. Nessler tubes. Twenty phenol wasted were sampled as they were discharged into the Maumee River, and the phenolic content ranged from 0.004 p. p. m. to 19.0 p. p. m., with an average of 1.129 p. p. m. A concentration of 37.8 p. p. m. existed in one of the wastes being discharged into Ten Mile and Swan Creeks, with an average of 7.308 p. p. m. Maximum concentrations of between zero and 0.072 p. p. m. phenol were found present in samples of water collected from Lake Erie and the Maumee River and tributaries. It was found that pure phenol when unchlorinated could be detected by the taste when present in undiluted Lake Erie water in concentrations of 25.0 p. p. m. The three cresols or their mixtures, however, gave a taste in concentrations of 0.10 to 0.30 p. p. m. After chlorination the iodoform or chloro-phenol taste was detected when phenol was present in 0.08 p. p. m. and when the cresols were present in concentrations of 0.02 p. p. m. This is in excess of the quantities which other workers have found to produce a noticeable taste; for instance, 0.002 p. p. m. phenol is reported to have produced tastes in Milwaukee. It is shown that the ratio of the minimum concentration of pure phenol and chlorine required to give a noticeable taste in filtered Maumee River water varied with the concentration. In other words, with 0.001 p. p. m. phenol, tastes were produced with 0.092 p. p. m. chlorine, whereas with 0.025 p. p. m. phenol it required 0.675 p. p. m. chlorine to produce a taste. With larger concentrations of phenol, smaller concentrations of chlorine produced tastes; for instance, 0.800 p. p. m. phenol produced a taste with 0.075 chlorine. It was concluded in the article that the sense of taste is more sensitive than the chemical procedures used in detecting phenol in water, although quantitative methods used at Toledo are justified because of the nature of the problems being studied. The discussion of this paper emphasizes the fact that the taste method has several weaknesses, namely, that the intensity of taste depends upon the concentration of chlorine, the temperature of the water, and the physical quality of the water independent of the phenolic content.

Five Years' Operation of a Rapid Sand Filtration Plant. M. C. Whipple and H. C. Chandler. *The American City*, vol. 38, No. 1, January, 1928, pp. 133–138. (Abstract by C. R. Cox.)

This article gives a comprehensive description of the new rapid sand filtration plant of Cambridge, Mass., together with a discussion of the problems of operation. Highly colored water from two sources was coagulated during the first three years with alum in basins with a detention period of 2.5 hours. The dose of alum varied between 1.15 and 1.73 g. p. g. Provisions were made to add soda ash to the raw water when necessary to provide alkalinity, although

this treatment was seldom needed. About two years ago the use of solid sodium aluminate was begun, and improved coagulation has resulted by the use of 1.0 g. p. g. of alum and 0.2 g. p. g. of sodium aluminate. This modified treatment has permitted a reduction of about 50 per cent in the soda ash dose applied to the filtered water to prevent corrosion of the distribution system, and the water in the plant is less corrosive to the equipment. A chlorine dose of 0.25 p. p. m. produces a nearly sterile final effluent.

No mixing basin is provided, and the 2.5 hours' coagulation and sedimentation period is insufficient at times. Color in stored water is easier to coagulate than fresh color from swamps in times of flood run-off. Two and one-half-inch lead piping for alum solution requires constant attention to prevent clogging. Daily flushing under pressure, weekly bleach treatment to kill *Leptothrix*, and periodic steaming are remedies in constant use. Even then, hand cleaning becomes necessary.

Filters are washed for 2½ minutes at velocities necessary to expand sand beds 30 per cent. This requires 27 inches vertical velocity at 70° F. and 20 inches at 38° F. Wash water is thus saved in winter. Water is drawn down to below sand bed before washing, to increase agitation of sand. Sand-bed shrinkage occurs in summer, although this occurs when coagulation is best and when filtered water is clear and colorless. The theory is that good floc forms dense surface mat which resists flow and is thus compressed and pulled away from walls. Beds are hand raked every 10 days. Caustic soda treatment with 0.25 per cent solution is applied twice each year to clean the sand grains.

DEATHS DURING WEEK ENDED MARCH 10, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended March 10, 1928, and corresponding week of 1927. (From the Weekly Health Index, March 14, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Mar. 10, 1928	Corresponding week, 1927
Policies in force	70, 512, 392	66, 961, 185
Number of death claims	14, 754	14, 258
Death claims per 1,000 policies in force, annual rate	10. 9	11. 1

Deaths from all causes in certain large cities of the United States during the week ended March 10, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, March 14, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Mar. 10, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 10, 1928[2]
	Total deaths	Death rate[1]		Week ended Mar. 10, 1928	Corresponding week 1927	
Total (68 cities)	8, 293	14. 3	14. 4	885	886	[3] 73
Albany[4]	39	16. 9	17. 5	4	3	82
Atlanta	80	16. 5	19. 1	10	13	
White	47		10. 1	6	3	
Colored	33	([5])	40. 2	4	10	
Baltimore[4]	241	15. 2	20. 0	22	41	70
White	174		17. 8	15	29	60
Colored	67	([5])	32. 5	7	12	110

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended March 10, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927—Continued

City	Week ended Mar. 10, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 10, 1928
	Total deaths	Death rate		Week ended Mar. 10, 1928	Corresponding week 1927	
Birmingham	81	19.0	16.1	12	8	103
White	41		15.7	7	4	97
Colored	40	(5)	16.6	5	4	113
Boston	236	15.4	17.6	38	33	105
Bridgeport	46			4	4	73
Buffalo	181	17.0	13.9	13	17	56
Cambridge	29	[illegible]	10.1	1	4	18
Camden	35	13.5	18.0	3	7	48
Canton	21	9.4	6.4	2	1	48
Chicago [4]	830	13.8	12.8	81	78	69
Cincinnati	161	20.3	18.0	8	8	48
Cleveland	193	10.0	10.0	12	20	33
Columbus	68	12.0	13.4	6	6	56
Dallas	42	10.1	9.1	1	8	
White	32		8.5	1	7	
Colored	10	(5)	13.3	0	1	
Dayton	40	11.3	16.2	4	7	66
Denver	100	17.8	18.7	9	8	
Des Moines	30	10.3	9.5	5	1	83
Detroit	324	12.3	13.0	62	64	96
Duluth	20	9.0	10.5	2	5	47
El Paso	47	20.9	13.3	6	9	
Erie	26			3	4	62
Fall River [4]	32	12.5	12.6	3	2	51
Flint	36	12.6	10.2	2	11	26
Fort Worth	49	15.2	13.1	6	3	
White	33		11.2	4	2	
Colored	16	(5)	26.6	2	1	
Grand Rapids	37	11.8	14.2	2	2	30
Indianapolis	100	13.7	11.6	6	7	46
White	85		10.6	5	3	44
Colored	15	(5)	18.6	1	4	61
Jersey City	76	12.2	12.7	13	12	97
Kansas City, Kans	32	14.1	18.2	[illegible]	3	190
White	25		17.8	7	3	173
Colored	7	(5)	22.1	2	0	290
Kansas City, Mo	115	15.4	14.3	14	14	99
Knoxville	36	17.9	19.9	9	3	195
White	29		16.8	7	3	169
Colored	7	(5)	42.7	2	0	427
Los Angeles	293			26	21	74
Lowell	35	16.6	15.1	4	10	84
Lynn	15	7.4	11.9	0	4	0
Memphis	80	22.0	20.7	11	3	129
White	45		17.2	3	0	56
Colored	35	(5)	27.1	8	3	251
Milwaukee	118	11.3	12.7	16	22	71
Minneapolis	94	10.8	10.4	4	10	24
Nashville	54	20.4	20.4	7	3	110
White	29		11.6	4	2	85
Colored	25	(5)	42.9	3	1	180
New Bedford	21	9.2	10.5	5	4	108
New Haven	49	13.6	14.4	3	7	42
New Orleans	174	21.2	19.5	19	14	92
White	104		16.8	11	7	80
Colored	70	(5)	27.4	8	7	116
New York	1,622	14.1	14.9	166	165	67
Bronx Borough	199	11.0	10.4	22	21	66
Brooklyn Borough	512	11.6	14.1	52	70	52
Manhattan Borough	732	21.8	19.8	83	56	98
Queens Borough	147	9.0	10.8	8	17	32
Richmond Borough	32	11.1	17.8	1	1	18
Newark, N. J	152	16.8	14.6	18	17	93
Oakland	62	11.8	10.1	7	6	76
Oklahoma City	33			7	4	
Omaha	57	13.4	12.8	3	3	35
Paterson	31	12.3	13.8	4	3	69
Philadelphia	592	15.0	15.8	65	57	68
Pittsburgh	227	17.7	15.2	30	12	98
Portland, Oreg	69			2	3	21

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended March 10, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927—Continued

City	Week ended Mar. 10, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 10, 1928
	Total deaths	Death rate		Week ended Mar. 10, 1928	Corresponding week 1927	
Providence	72	13.1	15.6	9	8	78
Richmond	50	13.4	15.2	8	6	104
White	27		11.1	4	3	81
Colored	23	(5)	25.3	4	3	147
Rochester	78	12.4	15.1	4	11	32
St. Louis	285	17.6	14.8	22	19	74
St. Paul	72	14.9	11.5	11	5	105
Salt Lake City [4]	31	11.7	7.3	11	4	179
San Antonio	87	20.9	15.0	11	11	
San Diego	51	22.3	28.5	1	5	19
San Francisco	183	16.3	14.5	11	11	69
Schenectady	16	9.0	8.4	1	1	31
Seattle	94	12.8	9.3	6	5	62
Somerville	26	13.2	9.8	3	0	104
Spokane	33	15.8	15.8	4	3	103
Springfield, Mass	34	11.9	12.4	6	1	95
Syracuse	70	18.4	13.5	12	3	146
Tacoma	21	9.9	16.5	1	3	26
Toledo	74	12.4	13.1	2	9	19
Trenton	49	18.4	19.5	5	6	102
Washington, D. C	144	13.6	17.2	13	16	74
White	93		14.3	5	8	41
Colored	51	(5)	25.7	8	8	148
Waterbury	14			1	4	29
Wilmington, Del	33	13.4	13.2	2	4	53
Worcester	43	11.4	16.5	3	7	36
Yonkers	22	9.5	11.4	7	2	160
Youngstown	28	8.4	14.2	4	8	43

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 67 cities.
[4] Deaths for week ended Friday, Mar. 9, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occuring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended March 19, 1927, and March 17, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 19, 1927, and March 17, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928
New England States:								
Maine	11	7	3	3	141	66	1	1
New Hampshire	...	...	...	...	...	16	...	0
Vermont	...	...	...	...	64	31	0	0
Massachusetts	91	102	22	14	270	1,860	1	5
Rhode Island	9	10	...	...	1	80	1	0
Connecticut	27	19	13	5	211	398	0	2
Middle Atlantic States:								
New York	387	345	[1] 82	[1] 60	830	2,373	5	26
New Jersey	113	124	63	28	40	1,131	3	1
Pennsylvania	232	242	...	...	804	1,415	1	12
East North Central States:								
Ohio	...	241	...	102	...	865	...	7
Indiana	19	29	21	36	200	199	0	0
Illinois	137	134	54	158	2,585	230	1	13
Michigan	108	72	...	10	286	1,619	0	2
Wisconsin	40	19	70	63	574	134	7	8
West North Central States:								
Minnesota	19	20	3	3	228	100	5	2
Iowa [3]	12	12	...	...	912	29	2	1
Missouri	51	[4] 39	11	[4] 70	254	[4] 200	4	[4] 6
North Dakota	1	4	...	...	319	...	1	2
South Dakota	...	3	1	...	270	14	0	0
Nebraska	12	9	36	52	200	15	0	2
Kansas	20	18	10	16	1,105	72	1	1
South Atlantic States:								
Delaware	...	...	...	...	6	15	0	0
Maryland [3]	46	36	370	48	61	1,189	1	1
District of Columbia	28	...	10	...	2	...	0	...
Virginia	...	...	...	...	...	...	...	...
West Virginia	16	15	37	45	218	112	0	2
North Carolina	30	35	...	...	542	3,246	2	0
South Carolina	21	20	1,977	944	94	1,020	0	0
Georgia	10	14	361	175	244	187	0	3
Florida	21	7	...	6	153	48	0	0

[1] New York City only.
[3] Week ended Friday.
[4] Exclusive of Kansas City.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 19, 1927, and March 17, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928
East South Central States:								
Kentucky		11		21		279		0
Tennessee	9	20	164	115	163	298	0	0
Alabama	10	15	141		231	496	3	2
Mississippi	7	22						
West South Central States:								
Arkansas	9	6	64	628	113	385	0	7
Louisiana	15	30	26	114	133	267	0	1
Oklahoma [3]	13	17	139	451	231	325	3	3
Texas	32	24	69	306	121	125	0	1
Mountain States:								
Montana		11			49	1	8	5
Idaho	10	1			64		0	2
Wyoming		1			82	56	0	0
Colorado	7	5	2	1	324	34	0	6
New Mexico	6		2		75		0	
Arizona	2	7	3		12	31	0	8
Utah [2]	10	2	2	5	234	2	0	3
Pacific States:								
Washington	14	5			230	273	4	9
Oregon	16	7	123	50	101	115	2	1
California	122	103	81	42	2,865	187	5	6

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928
New England States:								
Maine	1	0	20	26	0	0	8	3
New Hampshire		0		20		0		0
Vermont	0	0	4	3	0	0	0	0
Massachusetts	0	2	586	316	0	0	9	2
Rhode Island	0	0	37	46	0	0	0	0
Connecticut	0	0	151	80	0	0	0	0
Middle Atlantic States:								
New York	0	0	1,240	822	9	13	19	11
New Jersey	1	1	887	285	0	0	3	1
Pennsylvania	0	1	705	559	0	0	20	11
East North Central States:								
Ohio		2		351		48		12
Indiana	0	0	213	131	158	144	3	2
Illinois	2	1	348	389	61	54	11	16
Michigan	0	1	363	213	53	39	7	3
Wisconsin	1	0	185	235	6	21	0	2
West North Central States:								
Minnesota	1	0	257	152	1	1	6	3
Iowa [2]	0	0	77	71	47	66	1	0
Missouri	0	[4] 0	132	[4] 78	29	[4] 72	1	[4] 1
North Dakota	2	1	83	39	7	2	3	0
South Dakota	0	3	49	57	11	11	2	2
Nebraska	0	1	45	116	15	40	0	0
Kansas	2	1	205	168	58	96	2	3
South Atlantic States:								
Delaware	0	0	29	6	0	0	0	0
Maryland [2]	0	0	118	70	2	2	9	3
District of Columbia	0		29		0		1	
Virginia								
West Virginia	0	1	29	44	66	106	1	7
North Carolina	1	0	36	21	34	90	0	2
South Carolina	1	1	7	12	22	14	5	6
Georgia	0	0	12	6	88	0	1	3
Florida	0	0	14	4	52	6	14	1

[2] Week ended Friday. [3] Exclusive of Tulsa. [4] Exclusive of Kansas City.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 19, 1927, and March 17, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928	Week ended Mar. 19, 1927	Week ended Mar. 17, 1928
East South Central States:								
Kentucky		0		48		36		1
Tennessee	0	0	21	24	15	36	14	3
Alabama	0	1	13	15	66	9	14	7
Mississippi	1	0	16	9	3	4	6	2
West South Central States:								
Arkansas	1	1	10	16	2	2	24	3
Louisiana	1	0	4	14	15	32	9	17
Oklahoma [2]	0	0	33	44	62	174	23	13
Texas	0	0	28	28	72	121	2	3
Mountain States:								
Montana	0	0	56	18	25	15	0	1
Idaho	0	0	19	7	11	0	0	0
Wyoming	0	0	30	17	6	11	0	0
Colorado	0	0	172	67	13	4	1	2
New Mexico	0		15		4		1	
Arizona	0	0	8	5	0	19	0	4
Utah [1]	0	0	21	9	9	13	1	0
Pacific States:								
Washington	0	3	91	42	36	32	3	3
Oregon	0	2	63	27	17	46	0	2
California	1	3	204	189	26	26	10	5

[1] Week ended Friday. [2] Exclusive of Tulsa.

Report for Week Ended March 10, 1928

DISTRICT OF COLUMBIA

	Case
Diphtheria	15
Influenza	4
Measles	102
Scarlet fever	58
Smallpox	1

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December, 1927										
Delaware	0	17	4		29		0	15	0	5
February, 1928										
Alabama	2	119	898	45	1,033	14	5	49	23	39
North Dakota	5	26	4		26		1	257	16	6
Tennessee	9	76	610	21	2,298	12	1	152	115	31
Vermont	0	3			104		0	59	0	1

December, 1927

Delaware: Cases

Chicken pox	20
Mumps	30
Whooping cough	5

February, 1928

Chicken pox:	
Alabama	167
North Dakota	55
Tennessee	135
Vermont	193
Dengue:	
Alabama	1
Dysentery:	
Tennessee	1
Lethargic encephalitis:	
Alabama	3
North Dakota	9
Tennessee	5
Vermont	1

	Cases
Mumps:	
Alabama	92
North Dakota	50
Tennessee	425
Vermont	144
Ophthalmia neonatorum:	
Tennessee	7
Rabies in man:	
Alabama	1
Trachoma:	
Tennessee	18
Tularaemia:	
North Dakota	1
Tennessee	4
Typhus fever:	
Alabama	2
Whooping cough:	
Alabama	69
North Dakota	14
Tennessee	80
Vermont	79

PLAGUE-INFECTED GROUND SQUIRRELS—SANTA CRUZ, CALIF.

A report dated February 27, 1928, states that six ground squirrels shot in the outskirts of the city of Santa Cruz, Calif., have proved positive for plague. The squirrels were shot in the immediate vicinity of the place where the boy who contracted plague was engaged in trapping squirrels. (See PUBLIC HEALTH REPORTS, March 16, 1928, p. 628.)

Poisoning operations against squirrels in this vicinity are being carried out by the extensive use of thalium poisoned grain. Trapping operations directed against rats are in progress in the city of Santa Cruz, but no rat suspected of plague infection had been caught at the time of the report.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 98 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of nearly 30,450,000. The estimated population of the 98 cities reporting deaths is more than 30,440,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended March 3, 1928, and March 5, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	1,862	1,832	
98 cities	1,008	1,062	921
Measles:			
42 States	18,713	15,408	
98 cities	6,345	5,167	
Poliomyelitis:			
43 States	43	11	

Weeks ended March 3, 1928, and March 5, 1927—Continued

	1928	1927	Estimated expectancy
Scarlet fever:			
43 States	5,246	6,247	----------
98 cities	1,723	2,451	1,406
Smallpox:			
43 States	1,150	999	----------
98 cities	101	127	135
Typhoid fever:			
43 States	148	247	----------
98 cities	54	51	38
Deaths reported			
Influenza and pneumonia:			
98 cities	1,237	1,112	----------
Smallpox:			
98 cities	1	0	----------
Charleston, W. Va.	1	0	----------

City reports for week ended March 3, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	4	1	2	0	0	1	11	3
New Hampshire:									
Concord	[1] 22,546	0	1	1	0	0	0	0	2
Manchester	84,000	0	2	0	0	1	4	0	0
Vermont:									
Barre	[1] 10,008	0	1	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	58	48	28	1	1	589	13	43
Fall River	131,000	8	4	2	0	0	2	2	4
Springfield	145,000	4	3	2	0	0	2	51	1
Worcester	193,000	6	3	7	0	0	23	42	1
Rhode Island:									
Pawtucket	71,000	2	1	1	0	0	5	16	5
Providence	275,000	3	9	8	1	1	25	7	9
Connecticut:									
Bridgeport	[2]	0	7	4	0	0	0	1	4
Hartford	164,000	11	8	5	0	1	5	1	3
New Haven	182,000	--------	2	--------	--------	--------	--------	--------	--------

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended March 3, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	12	13	18		0	516	38	23
New York	5,924,000	265	212	308	40	17	663	47	265
Rochester	321,000	23	9	8	2	0	6	28	9
Syracuse	185,000	53	4	2		0	118	24	7
New Jersey:									
Camden	131,000	2	5	4	1	1	3	8	6
Newark	459,000	30	13	23	8	0	331	30	17
Trenton	134,000	3	3	6	0	1	2	2	2
Pennsylvania:									
Philadelphia	2,008,000	111	76	81		6	237	133	88
Pittsburgh	637,000		21			6			24
Reading	114,000	17	3	1		1	1	7	5
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	8	9	12	0	3	207	1	22
Cleveland	960,000	49	28	71	32	5	44	271	21
Columbus	285,000	12	4	1	1	1	18	7	12
Toledo	295,000	53	6	5	2	2	463	20	13
Indiana:									
Fort Wayne	99,900	0	2	4	0	0	2	0	7
Indianapolis	367,000	34	8	7	0	0	102	120	15
South Bend	81,700	2	1	1	0	0	1	0	0
Terre Haute	71,900	4	1	0	0	0	0	0	1
Illinois:									
Chicago	3,048,000	148	83	98	22	9	35	37	90
Peoria	82,500	10	1	1	0	0	6	0	0
Springfield	64,700	6	1	0	1	0	0	19	2
Michigan:									
Detroit	1,290,000	67	59	35	6	4	697	79	37
Flint	136,000	14	5	2	0	1	38	244	6
Grand Rapids	156,000	0	2	1	0	2	10	14	2
Wisconsin:									
Kenosha	52,700	17	2	0	0	0	0	4	0
Milwaukee	517,000	52	17	18	1	1	7	41	9
Racine	69,400	2	2	0	1	0	1	7	1
Superior	[1] 39,671	0	0	0	0	0	1	3	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	5	0	0	0	0	0	8	2
Minneapolis	434,000	66	16	8	0	3	11	119	10
St. Paul	248,000	29	13	0	0	0	1	78	12
Iowa:									
Davenport	[1] 52,469	1	1	0	0		0	0	
Des Moines	146,000	0	1	0	0		0	0	
Sioux City	78,000	8	2	0	0		15	17	
Waterloo	36,900	4	0	0	0		1	3	
Missouri:									
Kansas City	375,000	30	7	0	0	1	13	133	15
St. Joseph	78,400	1	1	0	0	0	0	9	2
St. Louis	830,000	31	44	44	6	0	134	14	
North Dakota:									
Fargo	[1] 26,403	4	0	1	0	0	0	17	0
Grand Forks	[1] 14,811	8	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	5	0	0	0		0	0	
Nebraska:									
Omaha	216,000	20	4	3	0	0	0	8	8
Kansas:									
Topeka	56,500	21	1	2	0	1	0	2	2
Wichita	92,500	5	3	0	0	0	0	2	5

[1] Estimated, July 1, 1925.

City reports for week ended March 3, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	3	2	6	0	0	2	5	2
Maryland:									
Baltimore	808,000	103	29	25	29	4	803	9	37
Cumberland	[1] 33,741	0	1	0	0	0	0	0	1
Frederick	[1] 12,035	0	0	0	0	0	2	0	0
District of Columbia:									
Washington	528,000	22	15	21	0	0	113	0	24
Virginia:									
Lynchburg	30,500	0	1	4	0	1	3	0	2
Norfolk	174,000	20	2	1	0	0	27	0	13
Richmond	189,000	6	3	5	0	3	132	1	8
Roanoke	61,900	6	1	3	0	0	4	3	1
West Virginia:									
Charleston	50,700	0	0	0	0	1	0	0	2
Wheeling	[1] 56,208	5	1	1	0	0	1	0	3
North Carolina:									
Raleigh	[1] 30,371	6	1	1	0	0	84	0	4
Wilmington	37,700	0	0	0	0	1	13	1	1
Winston-Salem	71,800	7	1	2	0	0	159	20	4
South Carolina:									
Charleston	74,100	2	0	1	31	0	5	0	5
Columbia	41,800	10	1	0	0	0	62	44	6
Greenville	[1] 27,311	1	0	0	0	0	32	2	4
Georgia:									
Atlanta	(2)	15	3	4	36	6	3	7	8
Brunswick	[1] 16,809	0	0	0	0	0	16	9	1
Savannah	94,900	1	1	0	5	2	8	2	2
Florida:									
Miami	[1] 69,754	13	3	2	0	0	3	2	4
St. Petersburg	[1] 26,847		0			0			1
Tampa	102,000	7	2	0	0	0	0	3	1
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	1	1	1	0	0	29	2	5
Louisville	311,000		5						
Tennessee:									
Memphis	177,000	9	4	6	0	5	121	31	7
Nashville	137,000	8	1	0	0	1	15	4	9
Alabama:									
Birmingham	211,000	14	3	5	16	5	55	7	10
Mobile	66,800	0	0	1	8	5	0	0	1
Montgomery	47,000	22	0	1	2		0	3	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	5	1	0	0		2	0	
Little Rock	75,900	1	0	1	17	2	159	0	7
Louisiana:									
New Orleans	419,000	13	11	9	19	5	0	0	20
Shreveport	59,500	5	0	3	0	1	195	2	4
Oklahoma:									
Oklahoma City	(2)	3	2	6	7	2	14	0	4
Tulsa	133,000	33		1	0		1	40	
Texas:									
Dallas	203,000	34	6	3	2	1	0	0	11
Fort Worth	159,000	7	2	6	4	1	0	3	6
Galveston	49,100	2	1	1	0	0	3	0	2
Houston	[1] 164,954	7	3	4	0	1	21	0	9
San Antonio	205,000	0	2	2	0	15	44	0	11
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	6
Great Falls	[1] 29,883	19	1	0	0	0	1	0	1
Helena	[1] 12,037	0	0	6	0	0	0	0	1
Missoula	[1] 12,668	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	0	0	0	0	0	0	1	0

[1] Estimated July 1, 1925.

[2] No estimate made.

City reports for week ended March 3, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
MOUNTAIN—continued									
Colorado:									
Denver	285,000	50	11	9	-------	4	14	61	16
Pueblo	43,900	5	1	0	0	3	1	0	2
New Mexico:									
Albuquerque	[1] 21,000	0	0	1	0	0	49	1	1
Utah:									
Salt Lake City	133,000	17	2	6	0	3	0	5	2
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	([2])	25	6	1	0	-------	253	19	-------
Spokane	109,000	4	2	2	0	-------	2	0	-------
Tacoma	106,000	11	2	0	0	0	18	22	3
Oregon:									
Portland	[1] 282,383	27	7	1	3	0	17	1	6
California:									
Los Angeles	([2])	92	37	38	30	2	19	33	30
Sacramento	73,400	16	2	1	2	1	22	5	5
San Francisco	567,000	85	21	13	2	4	35	54	8

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	4	3	0	0	0	2	1	0	0	9	26
New Hampshire:											
Concord	1	0	0	0	0	0	0	0	0	0	8
Manchester	3	3	0	0	0	0	0	0	0	0	18
Vermont:											
Barre	1	0	0	0	0	0	0	0	0	0	2
Massachusetts:											
Boston	78	75	0	0	0	12	2	0	0	78	260
Fall River	3	12	0	0	0	4	0	0	0	0	32
Springfield	7	21	0	0	0	2	0	0	0	5	35
Worcester	10	6	0	0	0	2	0	0	0	3	56
Rhode Island:											
Pawtucket	1	1	0	0	0	0	0	0	0	0	26
Providence	9	26	0	0	0	5	0	0	0	8	78
Connecticut:											
Bridgeport	12	0	0	0	0	2	0	0	0	4	28
Hartford	6	5	0	0	0	3	0	0	0	4	46
New Haven	11	-------	0	-------	-------	-------	1	-------	-------	-------	-------
MIDDLE ATLANTIC											
New York:											
Buffalo	23	50	0	0	0	13	1	0	0	39	167
New York	302	417	0	0	0	120	7	9	1	180	1,692
Rochester	15	8	0	0	0	3	0	0	0	7	79
Syracuse	12	20	0	0	0	3	0	0	0	66	63
New Jersey:											
Camden	6	0	0	0	0	2	0	0	0	2	34
Newark	33	52	0	0	0	5	0	0	0	26	134
Trenton	5	1	0	0	0	3	0	0	0	0	35
Pennsylvania:											
Philadelphia	85	98	0	0	0	42	2	2	0	98	605
Pittsburgh	33	-------	0	-------	0	10	0	-------	0	-------	180
Reading	3	31	0	0	0	2	0	0	0	8	29

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended March 3, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	19	20	2	1	0	10	1	0	0	2	152
Cleveland	58	40	0	0	0	9	1	1	0	94	210
Columbus	11	11	1	0	0	5	1	0	0	0	66
Toledo	14	9	2	0	0	5	0	0	0	7	88
Indiana:											
Fort Wayne	5	7	0	1	0	2	0	0	0	0	22
Indianapolis	11	25	12	4	0	6	0	0	0	2	105
South Bend	8	0	1	0	0	0	0	0	0	6	18
Terre Haute	3	0	0	0	0	2	0	0	0	0	21
Illinois:											
Chicago	140	123	3	3	0	56	3	1	0	90	830
Peoria	4	7	1	6	0	0	0	0	0	4	0
Springfield	2	38	0	2	0	1	1	0	0	2	24
Michigan:											
Detroit	98	117	2	[illegible]	0	25	1	1	0	79	320
Flint	8	12	0	6	0	6	0	2	0	13	34
Grand Rapids	11	8	1	0	0	1	1	0	0	2	39
Wisconsin:											
Kenosha	3	3	0	1	0	0	0	0	0	14	7
Milwaukee	29	52	2	0	0	6	0	0	0	14	103
Racine	4	14	1	0	0	1	0	0	0	9	17
Superior	3	3	1	0	0	2	0	0	0	0	9
WEST NORTH CENTRAL											
Minnesota:											
Duluth	8	8	1	0	0	0	0	0	0	17	19
Minneapolis	62	25	5	0	0	1	0	1	0	10	88
St. Paul	34	6	6	0	0	6	0	0	0	3	57
Iowa:											
Davenport	1	4	3	0	------	------	0	0	------	0	------
Des Moines	7	15	1	15	------	------	0	0	------	0	37
Sioux City	1	2	1	0	------	------	0	0	------	0	------
Waterloo	1	14	1	1	------	------	0	0	------	0	------
Missouri:											
Kansas City	12	22	4	2	0	8	0	0	0	15	115
St. Joseph	3	4	0	10	0	2	0	0	0	0	31
St. Louis	40	34	5	2	0	22	1	1	0	24	292
North Dakota:											
Fargo	3	1	0	0	0	0	0	0	0	3	0
Grand Forks	0	2	0	0	------	------	0	0	------	0	------
South Dakota:											
Aberdeen	4	0	0	0	------	------	0	0	------	0	------
Nebraska:											
Omaha	7	13	9	6	0	1	0	1	0	0	53
Kansas:											
Topeka	3	2	0	2	0	0	0	0	0	9	14
Wichita	4	3	1	9	0	1	0	0	0	1	38
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	1	0	0	0	2	0	0	0	2	21
Maryland:											
Baltimore	41	30	0	0	0	11	2	0	0	24	273
Cumberland	1	2	0	0	0	1	0	0	0	0	14
Frederick	1	0	0	0	0	0	0	0	0	0	4
Dist. of Columbia:											
Washington	26	45	1	0	0	6	1	0	0	7	144
Virginia:											
Lynchburg	1	1	0	0	0	0	0	0	0	17	9
Norfolk	3	36	0	0	0	4	0	0	0	1	------
Richmond	8	4	0	0	0	3	0	1	0	0	56
Roanoke	1	4	1	0	0	1	0	0	0	3	12
West Virginia:											
Charleston	0	5	1	3	1	1	0	0	0	0	29
Wheeling	3	4	0	0	0	0	0	0	0	0	19
North Carolina:											
Raleigh	1	1	1	0	0	3	0	0	0	4	20
Wilmington	0	0	0	0	0	0	0	1	1	3	18
Winston-Salem	0	2	3	1	0	3	0	0	0	5	21

City reports for week ended March 3, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
South Carolina:											
Charleston	0	0	0	0	0	3	1	0	0	0	22
Columbia	0	1	1	0	0	0	0	0	0	3	25
Greenville	0	1	1	0	0	0	0	0	0	4	13
Georgia:											
Atlanta	4	5	7	0	0	4	0	0	0	2	94
Brunswick	0	0	0	0	0	0	0	0	0	0	4
Savannah	0	1	1	7	0	3	0	2	0	0	28
Florida:											
Miami	1	1	0	0	0	1	0	0	0	1	26
St. Petersburg	1		0		0	0	0		0		16
Tampa	1	2	0	0	0	5	2	3	1	0	24
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	3	0	0	0	3	0	0	0	0	26
Louisville	6		1				0				
Tennessee:											
Memphis	4	6	3	0	0	10	1	2	0	5	68
Nashville	4	0	2	0	0	6	1	2	0	2	55
Alabama:											
Birmingham	2	2	7	0	0	5	0	6	0	0	78
Mobile	0	5	1	0	0	3	0	0	0	0	26
Montgomery	0	0	0	0			0	0		0	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	2	0	0			0	0		1	
Little Rock	1	3	0	0	0	1	0	0	0	0	
Louisiana:											
New Orleans	7	6	1	1	0	16	2	5	0	9	166
Shreveport	1	3	1	0	0	1	0	1	1	7	38
Oklahoma:											
Oklahoma City	3	2	0	16	0	0	0	0	0	0	24
Tulsa		20		4				0		5	
Texas:											
Dallas	2	5	5	3	0	2	0	1	1	3	56
Fort Worth	0	3	2	1	0	1	0	0	0	0	37
Galveston	1	0	1	0	0	1	1	0	0	0	16
Houston	1	3	3	1	0	11	0	1	0	0	53
San Antonio	1	2	1	0	0	5	0	0	0	0	116
MOUNTAIN											
Montana:											
Billings	2	0	0	0	0	0	0	0	0	1	15
Great Falls	2	0	1	1	0	0	0	0	0	2	11
Helena	0	2	0	0	0	0	0	0	0	0	4
Missoula	1	0	1	0	0	0	0	0	0	0	2
Idaho:											
Boise	1	0	1	0	0	0	0	0	0	1	13
Colorado:											
Denver	15	16	2	1	0	10	0	0	0	6	93
Pueblo	1	9	0	0	0	0	0	0	0	4	19
New Mexico:											
Albuquerque	2	0	0	0	0	6	0	0	0	0	16
Utah:											
Salt Lake City	3	2	1	2	0	1	0	1	0	11	37
Nevada:											
Reno	0	0	0	2	0	0	0	0	0	0	10
PACIFIC											
Washington:											
Seattle	11	0	5	0			1	0		6	
Spokane	6	16	6	17			0	0		1	
Tacoma	2	1	3	0	0	1	0	0	0	4	26
Oregon:											
Portland	7	9	10	38	0	8	0	0	1	0	79
California:											
Los Angeles	32	25	8	0	0	25	2	0	0	19	250
Sacramento	2	1	0	1	0	1	0	0	0	4	
San Francisco	15	33	5	1	0	14	1	3	0	14	165

City reports for week ended March 3, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	0	0	0	0	0	1	1	0
Worcester	0	0	1	0	0	0	0	0	0
Connecticut:									
Hartford	1	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	9	10	7	4	0	0	1	4	1
Pennsylvania:									
Philadelphia	2	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	1	1	1	0	0	0	0	0	0
Toledo	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago [1]	5	1	0	0	2	2	0	0	0
Michigan:									
Detroit	1	0	0	0	0	0	1	0	0
Wisconsin:									
Milwaukee	3	1	0	0	0	0	0	0	0
Racine	1	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Missouri:									
St. Louis	2	2	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	2	0	0	0	0	0	0
SOUTH ATLANTIC									
Virginia:									
Lynchburg	0	0	0	0	0	1	0	0	0
Georgia:									
Atlanta	0	0	0	0	0	2	0	0	0
Savannah [2]	0	0	0	0	1	1	0	0	0
Florida:									
Tampa	0	1	0	0	0	0	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Birmingham	0	0	0	0	3	3	0	0	0
Mobile	0	0	0	0	0	1	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	1	0	1	0	0	1	0
Shreveport	0	0	0	0	0	1	0	0	0
Texas:									
Dallas	0	0	0	0	1	1	0	0	0
Houston	1	0	0	0	0	0	0	0	0
San Antonio	0	0	0	0	0	1	0	0	0
MOUNTAIN									
Colorado:									
Denver	4	2	0	0	0	0	0	0	0
Pueblo	2	1	0	0	0	0	0	0	0
Utah:									
Salt Lake City	1	0	0	0	0	0	0	0	0
Nevada:									
Reno	1	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Spokane	4	0	0	0	0	0	0	0	0
Tacoma	0	1	0	0	0	0	0	0	0
Oregon:									
Portland	2	1	0	0	0	0	0	0	0
California:									
Los Angeles	1	0	0	0	0	0	0	2	1

[1] Rabies (human); 1 case and 1 death at Chicago, Ill.
[2] Typhus fever: 2 cases at Savannah, Ga.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended March 3, 1928, compared with those for a like period ended March 5, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below:

Summary of weekly reports from cities, January 22 to February 25, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928
101 cities	194	190	177	167	203	175	179	174	182	[2] 173
New England	146	193	174	136	133	172	149	138	168	[3] 150
Middle Atlantic	229	278	188	230	277	234	199	224	228	[4] 236
East North Central	201	145	179	175	168	169	198	169	176	164
West North Central	123	113	154	99	164	125	109	125	115	113
South Atlantic	143	167	222	112	191	149	191	156	195	130
East South Central	127	55	61	55	86	55	117	35	81	[5] 102
West South Central	232	152	149	128	170	124	194	188	149	92
Mountain	188	106	152	44	161	186	72	71	233	186
Pacific	217	156	167	133	188	82	151	161	133	141

MEASLES CASE RATES

	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928
101 cities	570	724	652	791	810	892	862	998	880	[2] 1,090
New England	379	1,508	339	1,614	181	1,657	228	1,908	172	[3] 1,634
Middle Atlantic	41	618	45	647	68	700	74	877	67	[4] 978
East North Central	695	359	786	440	1,009	531	1,015	565	1,173	761
West North Central	453	222	683	216	564	240	960	255	952	341
South Atlantic	536	1,822	359	1,959	792	2,246	651	2,406	794	2,576
East South Central	269	1,192	451	1,132	467	1,347	461	1,202	538	[5] 1,600
West South Central	562	916	451	1,304	562	1,899	591	1,959	720	1,695
Mountain	7,217	115	7,845	186	9,665	97	10,624	168	8,132	142
Pacific	1,538	708	2,220	718	2,774	692	2,865	749	3,030	892

SCARLET FEVER CASE RATES

	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928
101 cities	403	270	390	300	438	291	424	295	418	[2] 296
New England	509	359	537	432	470	441	542	414	428	[3] 373
Middle Atlantic	433	295	423	333	581	330	531	335	532	[4] 353
East North Central	324	289	325	310	322	280	366	285	399	309
West North Central	521	247	499	290	540	265	445	275	443	261
South Atlantic	245	207	258	231	249	228	218	282	180	254
East South Central	243	130	223	135	243	190	183	185	218	[5] 116
West South Central	124	132	74	100	66	116	116	120	66	96
Mountain	1,515	380	1,246	540	1,246	345	1,192	208	1,076	257
Pacific	436	217	389	192	340	230	313	283	329	194

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] New Haven, Conn., Pittsburgh, Pa., and Louisville, Ky., not included.
[3] Hew Haven, Conn., not included.
[4] Pittsburgh, Pa., not included.
[5] Louisville, Ky., not included.

Summary of weekly reports from cities, January 22 to February 25, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SMALLPOX CASE RATES

	Week ended—									
	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928
101 cities	25	21	26	21	33	20	25	24	21	[2] 17
New England	0	0	0	0	0	0	0	0	0	[3] 0
Middle Atlantic	0	0	0	0	0	0	0	0	0	[4] 9
East North Central	22	9	15	14	28	12	15	18	21	18
West North Central	53	117	71	109	81	101	63	92	53	62
South Atlantic	43	18	63	21	60	26	45	26	52	19
East South Central	101	20	81	15	132	25	71	40	122	[5] 0
West South Central	79	12	66	16	62	20	50	8	50	20
Mountain	9	115	18	44	27	168	0	62	0	53
Pacific	63	59	76	69	94	18	104	125	13	49

TYPHOID FEVER CASE RATES

	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928
101 cities	7	7	7	7	9	5	8	5	9	[2] 9
New England	9	14	5	0	2	5	9	7	2	[3] 0
Middle Atlantic	9	5	5	6	10	3	1	5	5	[4] 6
East North Central	5	3	3	6	4	3	6	1	6	7
West North Central	4	2	6	6	10	4	8	4	10	6
South Atlantic	5	5	18	9	23	7	29	9	23	12
East South Central	5	15	10	5	30	15	25	20	41	[5] 73
West South Central	17	40	12	40	8	12	4	16	8	32
Mountain	0	9	0	0	0	0	18	0	9	9
Pacific	8	10	18	0	3	8	8	5	8	8

INFLUENZA DEATH RATES

	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928
95 cities	19	19	24	17	23	22	22	21	25	[6] 24
New England	5	9	2	7	9	11	12	7	9	[3] 8
Middle Atlantic	21	14	28	15	25	18	22	24	24	16
East North Central	9	13	22	10	19	12	17	14	23	17
West North Central	12	10	14	4	23	6	10	2	17	10
South Atlantic	27	23	23	30	31	35	41	28	47	32
East South Central	58	68	37	42	43	37	43	31	21	[5] 125
West South Central	64	45	38	57	38	90	25	74	38	103
Mountain	45	53	72	53	27	71	54	35	54	88
Pacific	7	34	21	20	17	27	17	20	17	24

PNEUMONIA DEATH RATES

	Feb. 5, 1927	Feb. 4, 1928	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928
95 cities	168	150	147	168	146	174	163	161	171	[6] 188
New England	188	126	165	149	102	170	184	147	202	[3] 188
Middle Atlantic	197	129	173	200	148	195	176	155	193	217
East North Central	121	129	128	114	121	137	145	156	132	148
West North Central	135	49	95	106	91	94	91	71	104	106
South Atlantic	222	198	168	224	234	216	253	228	229	217
East South Central	207	131	117	235	175	201	122	220	271	[5] 249
West South Central	149	209	144	201	204	279	161	271	183	263
Mountain	143	203	143	150	188	168	134	248	126	265
Pacific	121	128	114	182	176	172	131	115	121	155

[2] New Haven, Conn., Pittsburgh, Pa., and Louisville, Ky., not included.
[3] New Haven, Conn., not included.
[4] Pittsburgh, Pa., not included.
[5] Louisville, Ky., not included.
[6] New Haven, Conn., and Louisville, Ky., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31, 050, 300	31, 657, 000	30, 369, 500	30, 960, 700
New England	12	12	2, 242, 700	2, 274, 400	2, 242, 700	2, 274, 400
Middle Atlantic	10	10	10, 594, 700	10, 732, 400	10, 594, 700	10, 732, 400
East North Central	16	16	7, 820, 700	7, 991, 400	7, 820, 700	7, 991, 400
West North Central	12	10	2, 634, 500	2, 683, 500	2, 518, 500	2, 566, 400
South Atlantic	21	21	2, 890, 700	2, 981, 900	2, 890, 700	2, 981, 900
East South Central	7	6	1, 028, 300	1, 048, 300	980, 700	1, 000, 100
West South Central	8	7	1, 260, 700	1, 307, 600	1, 227, 800	1, 274, 100
Mountain	9	9	581, 600	591, 100	581, 600	591, 100
Pacific	6	4	1, 996, 400	2, 046, 400	1, 512, 100	1, 548, 900

FOREIGN AND INSULAR

SMALLPOX ON VESSEL

Mombasa, British East Africa—Steamship "Khandalla"—January 14, 1928.—The steamship *Khandalla* arrived at the port of Mombasa, British East Africa, with two deck passengers infected with smallpox. The cases were landed January 14, 1928. The *Khandalla* arrived at Durban, Natal, Union of South Africa, January 25, 1928, with no history of further outbreak of smallpox on board.

THE FAR EAST

Report for the week ended February 18, 1928.—The following report for the week ended February 18, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Alexandria, Suez.
Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Ceylon.—Colombo.
Siam.—Bangkok.
Straits Settlements.—Singapore.

CHOLERA

India.—Bombay, Calcutta, Negapatam, Rangoon.
Siam.—Bangkok.
French Indo-China.—Saigon

SMALLPOX

Aden Protectorate.—Perim.
Ceylon.—Colombo.
India.—Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon.
French India.—Pondicherry.
Dutch East Indies.—Banjermasin, Belawan-Deli.
Straits Settlements.—Singapore.
China.—Shanghai.
Kwantung.—Dairen.
Manchuria.—Mukden.

Returns for the week ended February 18, were not received from Samarinda, Dutch East Indies, nor Vladivostok, Union of Socialist Soviet Republics.

ANGOLA

Communicable diseases—November, 1927.—During the month of November, 1927, communicable diseases were reported in Angola as follows:

Disease	Coast District	Land Frontier	Interior	Total
Ancylostomiasis	2		5	7
Beriberi	2	6		8
Bilharzia	10		12	22
Chicken pox (including alastrim)	31		32	63
Dysentery	28	15	7	50
Erysipelas	1			1

Disease	Coast District	Land Frontier	Interior	Total
Hemoglobin fever	7	1	10	18
Influenza	50	139	66	255
Leprosy	2		9	11
Malaria	293	137	113	543
Measles	84			84
Meningitis			1	1
Mumps	2			2
Puerperal septicemia		1		1
Pneumonia	16	5	15	36
Relapsing fever		2		2
Scabies	8			8
Smallpox	7		1	8
Tetanus	5			5
Tuberculosis	20	3	4	27
Trypanosomiasis	120	24	42	186
Venereal diseases	177	92	31	300
Whooping cough	22		3	25
Yaws	139	33	93	265

CANADA

Provinces—Communicable diseases—Week ended March 3, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended March 3, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever					2			2
Influenza	18			11	1	5		35
Poliomyelitis				1				1
Smallpox		1		36		6	16	59
Typhoid fever	2	4	24	20	2			52

Quebec—Communicable diseases—Week ended March 3, 1928.—The Provincial Bureau of Health of Quebec reports cases of certain communicable diseases for the week ended March 3, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	54	Scarlet fever	104
Diphtheria	56	Smallpox	12
German measles	10	Tuberculosis	33
Influenza	8	Typhoid fever	24
Measles	300	Whooping cough	15

Sydney, Nova Scotia—Vital statistics, 1927.—The medical officer of the city of Sydney, Nova Scotia, reported 790 births and 232 deaths for the year 1927.

Communicable diseases were reported for the year as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Scarlet fever	27
Chicken pox	1	Tuberculosis	60
Diphtheria	9	Typhoid fever	10
Measles	39	Venereal diseases	55
Mumps	21		

CHILE

Concepcion—Vital statistics—October-December, 1927.—During the fourth quarter of the year 1927, 806 births were reported in Concepcion, Chile, and the number of deaths registered was the same.

There were 359 deaths of infants under one year of age, giving an infant mortality of 445 per 1,000 births.

The deaths included the following:

Disease	Deaths	Disease	Deaths
Bronchial pneumonia	41	Nephritis	7
Cancer	18	Pneumonia	138
Diabetes	2	Puerperal fever	4
Diphtheria	1	Syphilis	6
Dysentery	12	Tuberculosis	114
Influenza	6	Typhoid fever	5
Measles	19	Typhus fever	1

CUBA

Malaria—July, 1926, to December, 1927.—Malaria was officially reported in the city of Santiago, the Province of Oriente (including Santiago), and the Republic of Cuba, during the 18 months from July, 1926, to December, 1927, inclusive, as follows:

Quarter	Santiago de Cuba	Oriente Province	Republic of Cuba
1926			
July to September	146	883	1,857
October to December	1,587	2,538	5,662
1927			
January to March	1,757	3,296	4,938
April to June	492	776	1,161
July to September	888	1,556	1,861
October to December	1,178	1,506	2,105

Provinces—Communicable diseases—December 25, 1927–February 11, 1928.—During the period from December 25, 1927 to February 11, 1928, cases of communicable diseases were reported from the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cerebrospinal meningitis		2					2
Chicken pox	26	40	11	5	3	18	103
Diphtheria	1	25	12	8	2	15	63
Malaria		56	10	5	116	365	552
Measles		13	2		20	1	36
Paratyphoid fever		3		11	4	10	28
Scarlet fever	2	7	6	1			16
Tetanus (infantile)					1	2	3
Typhoid fever	19	97	11	37	13	60	237

GERMANY

Vital statistics—January to June, 1927.—Preliminary compilations of vital statistics of Germany for the first six months of the year 1927

show 244,496 marriages, 604,018 live births, 409,643 deaths (excluding stillbirths), and 20,362 stillbirths. As compared with similar statistics for the first six months of the year 1913, there was a decrease in the birth rate of about 29 per cent, while the death rate decreased about 16 per cent.

The infant mortality rate for the six months of 1927 was about 30 per cent lower than it was for the same period in 1913.

The following table gives a comparison of the rates for the first six months of the years 1913, 1925, 1926, and 1927:

	1913	1925	1926	1927
Marriages per annum per 1,000 population:				
First quarter	6.2	5.7	5.6	6.0
Second quarter	9.0	8.7	8.5	9.5
Births per annum per 1,000 population:				
First quarter	27.2	21.9	20.4	19.2
Second quarter	26.8	21.8	20.2	19.0
Deaths per annum per 1,000 population:				
First quarter	15.9	12.6	13.0	14.5
Second quarter	15.0	12.0	11.9	11.4
Deaths of infants under 1 year of age per 1,000 live births:				
First quarter	143	110	108	111
Second quarter	147	95	99	92

GREAT BRITAIN

England and Wales—Vital statistics, 1927.—The following table, showing birth and death rates in England and Wales for the year 1927, was prepared from figures published by the Registrar General of England and Wales:

	England and Wales	107 county boroughs and great towns	155 smaller towns	London
Birth rate per 1,000	16.7	17.1	16.4	16.1
Annual death rate per 1,000:				
All causes	12.3	12.2	11.3	11.9
Diphtheria	.07	.08	.05	.09
Influenza	.57	.49	.58	.39
Measles	.09	.12	.07	.04
Scarlet fever	.01	.01	.01	.01
Smallpox	.00	.00	.00	.00
Typhoid fever	.01	.01	.01	.01
Violence	.51	.48	.41	.51
Whooping cough	.09	.10	.08	.12
Death rate per 1,000 births:				
Diarrhea and enteritis (under 2 years)	6.3	8.3	5.0	7.5
All deaths under 1 year	69	71	68	59

London is included in the 107 county boroughs and great towns. The "smaller towns" are those with populations of from 20,000 to 50,000.

HAWAII TERRITORY

Island of Hawaii—Plague—February 16, 1928.—A death from bubonic plague occurred at Kukuihaele, Island of Hawaii, on February 16, 1928.

The last previously reported case of human plague at Kukuihaele occurred August 12, 1927, and plague has not been reported in rodents in the Island of Hawaii since December 20, 1927.

JAMAICA

Smallpox (alastrim)—January 29–February 25, 1928.—During the period January 29 to February 25, 1928, five new cases of smallpox (alastrim) were reported in the Island of Jamaica outside of Kingston.

Other communicable diseases.—During the same period other diseases were reported in Jamaica as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox		20	Puerperal fever		1
Dysentery	4	13	Tuberculosis	22	33
Erysipelas		1	Typhoid fever	22	82

Population: Kingston, 62,707; Island of Jamaica, 926,000.

PORTO RICO

Fajardo, vicinity of—Smallpox unofficially reported—March 12, 1928.—Under date of March 12, 1928, smallpox in epidemic form was unofficially reported present in the vicinity of Fajardo, Porto Rico.

UNION OF SOUTH AFRICA

Cape Province—Spread of plague infection among veldt rodents—February 10, 1928.—Information received under date of February 10, 1928, indicates serious spread of plague in veldt rodents in the Cape Province, Union of South Africa, during the past few months. The spread is stated to have taken place southward from the Calvinia district into the Ceres Basin to a point about 10 miles north of Ceres, and to the westward into Namaqualand to a line about 15 miles west of Springbok and roughly parallel with the coast. The affected area was stated to include Springbok, Garies, and Nieuwerust, extending to within a few miles of Van Rhynsdorp and about 25 miles northward of the protective belt which had been cleared of rodents along the Oliphant River and the irrigation canals. The wave of infection was stated to be spreading rapidly. Indications were noted that hares, which are numerous in that area, were playing an important part in spread of the infection.

It was stated that the spread into the Ceres Basin was especially important as that area is separated from the open gerbille-infested area on the Cape Peninsular side by a mountain barrier about 3 miles wide traversed by passes. It is intended to clear these passes of rodents and to strengthen the defences within the area.

Orange Free State—Plague—January 22–28, 1928.—During the week ended January 28, 1928, two cases of plague with one death, were reported in the Sastron district, Orange Free State. The occurrence was in natives and on a farm.

Typhus fever.—Fresh outbreaks of typhus fever were reported during the week ended January 28, 1928, in the Cape Province, in the Mount Frere district and in the Kroonstad district, Orange Free State.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Health Section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
China:																				
Amoy	C	2	28	72	16															
	D		7	3																
Canton	C	8	31	36	14	12		1												
	D	5	16	25	14	11		1												
Foochow	C	P	P	P	P															
Hong Kong	C	2	P	1	P															
	D	1																		
Shanghai (settlement and concession)—																				
Foreigners only	C		1	6	3															
Including natives	D		20	74	7															
Swatow	C	72	42	P	P	P														
	D	1		P	P	P														
Tientsin	C	P	P	15	2	P			1											
Dutch East Indies: Java—Batavia	C					28	2	1												
	D					18	2	1												
India	C	46,137	45,163	31,390	20,160	23,047	8,102	5,997	5,766	5,274	4,624	3,960	3,550	3,248						
	D	24,081	22,051	15,895	10,371	12,863	4,835	3,672	3,355	3,164	2,617	2,353	2,046	1,847						
Bassein	D	16															1			1
Bombay	C	75	42	3		2										1				
	D	35	30	2		2														
Calcutta	C	95	87	76	101	199	156	119	87	66	69	42	43	22	39	86	70			
	D	48	40	39	64	138	106	77	55	43	48	34	27	16	18	24	38	32	35	42
Madras	C	424	547	50	14	13			1					1	1			1	2	
	D	204	278	48	8	7	1		1					1		3		1		
Madras Presidency	C	11,491	7,660	3,056	2,050	3,073	1,484	861	878	479	503	382	482							
	D	4,807	3,513	1,581	1,055	1,736	802	528	491	283	941	209	254							
Negapatam	C														4					
	D														4	1		1	3	2
Rangoon	C	2	1	2	6	2	3	1	2	2	1	2		1	4					
	D	2	1	2	5	5	2	1	2	1	1	1		1			1	1	8	4
Tuticorin	C				1			6		2										
	D				1	37		6	6	2										

India (French):																				
Chandernagor	C	1	1	1		6	2	2	2	2	6	3	4	1	1					
	D	1	1			6	2	2	2	2	4	2	2	1						
Karikal	C	56	18	1		1				1			6	2	9					
	D	45	12	1		1				1			4		5					
Pondicherry	C	37	12	15		1		5	3	17	4	1	2	4	2					
	D	24	11	15		1		5	1	15	6	1	2	3	2					
Indo-China: Saigon	C			1	1								2	1	1	1		2	1	5
	D												1					1	1	1
Iraq [1]																				
Japan: Yokohama	C	1																		
	D	1																		
Philippine Islands: Manila	C	1	1																	
Siam	C	81	77	40	18	110	19	29	18	32	24	24	13	49	50	33				
	D	59	53	24	11	76	11	19	13	21	18	21	5	36	34	21				
Bangkok	C	6	2	3	5	4		1	1	1	2	3	7	9	11	28	28	34	23	17
	D	1	1	1	3	2		1		1	2	1	3	5	7	16	26	17	12	11
Straits Settlements: Singapore	C					7	1	2		2	3	15	3	2	2			1		
	D					5	2			2	1	4	5	2	1					
On vessel:																				
S. S. Adrastus: At Yokohama, Japan	C		1																	
	D		1																	
S. S. Tabaristan: At Basra, Iraq	C				1															

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			Feb. 1-10, 1928
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	
Indo-China (French):															
Annam	C	911	1,628	640	226	13	75	38	16	2		79	95	93	23
Cambodia	C	87	89	75	180	56	1	28	21	12	39	30	9	15	38
Cochin-China	C	257	68	141	178	21	27	52	17	38	58	46	119	130	178
Laos	C	20	190	36	67	10									
Tonkin	C	1,093	180	24	1			1			2	1			
Kwangchow-wan	C		1	15											

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	Mar. 3, 1928
Algeria: Oran	C		4	1		2															
	D		3	1																	
Arabia: Aden	C													19	13	22	54	89	63	45	
	D													7	8	8	33	55	50	31	
Argentina:																					
Bahia Blanca district	C						1	1	1												
Buenos Aires	C																	2			
Cordoba Province	C		2		P	P	10				1	1									
Entre Rios	C		5																		
Firmat	C									1											
Quilino	C						1	1	1												
Rosario	C						1	1	1	1	2	3				4			1		
Santiago Province	C																		1		
Ucacha	C									1											
Azores: St. Michaels Island	C	2	2	2	3	3	1	1	1		1		1		3	1	2	2			
	D			1	1				1					1	1	1	1	1			
Brazil:																					
Port Alegre [1]																					2
Rio de Janeiro	C														1		1	2			
British East Africa:																					
Tanganyika	C	P	P		P	P	P	P	P	P	P										
Uganda	C	528	456	226	99	99	24	27	16												
	D	413	345	158	88	96	21	25	15												
Canary Islands:																					
Las Palmas	C				0		1			2			2	1	1				1		
	D													1	1						
Teneriffe	C														1	3	3	3			
	D														1		3				
Ceylon: Colombo	C		1	3	1		1	1		4	3	2	1	1	1	1	1		8	3	
	D			3					2	4	3	1	1	1	1	1			1	3	
China:																					
Amoy	C	P																			
Tientsin	C		2																		
Tsingtao	D				200																

Dutch East Indies:																						
Balik-Papan	C										1											
	D										1											
Celebes—Makassar	C					6	1		1		2	1		3	2	1	1	1		1		
	D					6	1		1		2	1		2	2	1	1	1		1		
Java	D			432	779	829	291	275	251	200	209	179										
Batavia and West Java	C	40	71	68	130	132	45	43	32	34	32	36	24	36	46							
	D	40	71	68	129	132	44	43	32	33	32	36	24	36	44							
Cheribon	C							1														
	D							1														
East Java and Madura	C	29	28	18	17	10	5	3			3	2	1	1								
	D	29	27	18	17	10	5	3			3	2	1	1								
Pasoeroean Residency	C						P	P	P													
Surabaya Residency	C							P														
Surakarta Residency	C					P	P	P														
Egypt:																						
Alexandria	C		2	1			5	3	2	2	3	2					1		1			
	D						5	2			1	1					1		1			
Suez	C			1										1	1		3		3	4		
	D													1	1		1		3	3		
Greece:																						
Athens and Piræus	C		1	3	1							2	1									
	D				1							1										
Mitylene	C		1	5	1	3	1	1	1													
Patras	C		2	2	1	1																
	D				1	1																
Hawaii Territory: Hawaii	D		1																1			
India	C	404	1,391	2,710	3,246	3,600	1,193	1,228	1,348	1,749	1,085	1,197	2,596	2,219								
	D	241	836	1,428	1,792	2,065	668	742	773	1,085	733	899	1,804	1,498								
Bassein	D	23	12	14	8	4	3			1	2	13	2		3	3		2	1	2		
Bombay	C	14	14	7	4							1		2	5	4	2					
	D	13	11	5	3							1		1	2	2	3	2	6	14		
Calcutta	C			18																		
	D			10												1						
Madras Presidency	C	255	620	465	583	470	190	158	220	223	174	167	56	153								
	D	115	321	230	298	282	111	61	108	79	69	27	38	72								
Rangoon	C	21	15	6	11	11	5	2	6	2	2	4	4	7	8	9						
	D	20	14	6	11	11	5	2	5	3	2	3	4	7	7	7	6	10	12	15		
Indo-China: Saigon	C			2		1																
Iraq: Baghdad	C														1	1						
	D														1							
Nigeria: Lagos	C					17	4	3	4	2	2	1	1	6	2	3	3	2	2			
	D					17	4	3	3	3	1	1	1	5	3	3	3	2	2			
Senegal:																						
Baol	C	41	23	72	95	P		P														
	D	22	13	33	40																	
Cayor	C	126	227	463	176	48																
	D	74	166	233	88	28																
Dakar	C	67	46	20	1																	
	D	41	32	12																		
Louga	C			5	8																	
	D			4																		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927 — 3	10	17	24	31	January, 1928 — 7	14	21	28	February, 1928 — 4	11	18	25	Mar. 3, 1928
Senegal—Continued.																					
M'Bour	C	28																			
	D	23																			
Rufisque	C	104	44	16																	
	D	82	38	12																	
Thies	C	7		9	1	1															
	D	3		7																	
Tivaouane	C	43																			
	D	29																			
Siam	C				13	1	2			1	1	7	4	4	5						
	D				9		1			1	1	1	5	4	1						
Bangkok	C				2							1				1			1		
	D					1						1				1			1		
Straits Settlements: Singapore	C					1												1	1	1	
	D					1												1	1	1	
Turkey: Constantinople	C			1	1		1	1													
	D				1			1													
Union of South Africa:																					
Cape Providence	C					2			2						1						
	D					2			1						1						
Orange Free State	C	4				1	8	P								2					
	D	4				1	6									1					
U. S. S. R.:																					
Chita district	C				1																
	D				1																
Northern Caucasus	C			14	1																
	D			10																	
On vessel:																					
At La Plata, from Rosario, Argentina	C											1									
S. S. Aghios Gerasimos at Vigo, Spain	C					3															

Beirut, Syria, 1 case, Dec. 1-10.

Place		July	August	September	October	November	December	January
Algeria: Algiers	C				2			
British East Africa: Kenya	C	13	61	21	13	28	16	
Ecuador: Guayaquil	C	5	7	3	4	9	5	4
	D					3	2	4
Indo-China (French)	C			14	3	3	4	7
Madagascar	C	46	98	170	166	209	317	
	D	43	89	154	155	189	261	
Ambositra Province	C	6	1		6	1	18	
	D	6	1		6	1	10	
Antsirabe Province	C		34	5	19	18	72	
	D		34	4	19	17	72	
Itasy Province	C	14	11	21	16	26	62	
	D	14	7	20	15	25	54	
Madagascar—Continued.								
Moramanga Province	C	5	4	8	24	46	25	
	D	5	4	8	20	41	22	
Tananarive Province	C	21	48	142	90	170	139	
	D	19	43	127	93	153	108	
Mauritius	C			1				
Nigeria	C	9	8	15	27	16	20	16
	D	7	8	14	27	16	13	16
Peru	C	8	11	15	14	6	14	
	D	7	6	6	5	2	4	
Callao	D	3					3	
Lima	C						7	
	D				1	1	1	

SMALLPOX

Place		July 3-30, 1927	July 31-Aug 27, 1927	Aug. 28-Sept 24, 1927	Sept. 25-Oct 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	Mar. 3, 1928
Algeria	C	376	459	382	683	661		68	55	47	81	28				18	11				
Algiers	C									3	3	4		2	3	1	7				
Oran	C	14	9	16	11	20	9	11	10	9	8	15	2	4	2	2	4				
Arabia: Aden	C	2				1		1	1	1	1								1		
	D	1																			
Brazil:																					
Para	C		1																		
Rio de Janeiro	C	4	6	10		1															
	D	4	4	9		1															
British East Africa: Tanganyika	D		21	8	P	P	P	P	P				2	6	4						
British South Africa:																					
Northern Rhodesia	C	48	55	39	164	185	57	15	125	55	2	81	141	12	3						
	D	2	1	2	11	64	18	7	28	9		8	23								
Southern Rhodesia	C					3				2	1										
Canada:																					
Alberta	C	42	17	17	23	10	7	3	3	6		3	3	5	1	19	1	6		3	
Calgary	C	5	1																		
Edmonton	C				1	1	6		1	1			3	2	1			2	1		11
British Columbia: Vancouver	C			2					4		1	3	3	1	11	3	1	11	2	1	
Manitoba	C		13	9	7	19	1	3	1	2	2	2	2	5		1					
Winnipeg	C	3	5	4	2	2			1	1	1			1	1	1					
New Brunswick	C			2							1									1	
Nova Scotia	C			1	1																
Halifax	C				1																

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C, indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	Mar. 3, 1928
Canada—Continued.																					
Ontario	C	63	60	22	96	264	71	90	82	104		53	83	76	52	77	63	51	40	51	
Hamilton	C							2													
Kingston	C					1					1							1			
Ottawa	C	37	27	40	67	134	10	19		34	18	9	10	23	20	16	23	9	11	3	1
Toronto	C	5		2	10	34		25	14		7		11	10	8	5	1	6	4	4	2
Windsor	C				9																
Quebec	C	12	1		8	25	8	5	3		14	3	10	17	7		11	8	11	13	
Montreal	C					1					1		1	6	3	4	1		5	1	3
Quebec	C							2		2		2		3		5				2	5
Riviere du Loup	C					3															
Saskatchewan	C	25	14	68	31	34	9	15	19	15	12	13	15	12	39	15	9	34	7	8	
Moose Jaw	C		10	16	3					1		1	2	1	4	2	3	2		2	6
Regina	C	2	8		5	1				1											
Saskatoon	C								2			4			13	1		1		2	
Ceylon: Colombo	C		1			1		2							1			2	2	1	
	D		1					1							1						
China:																					
Antung	C	3												1							
Canton	C			1																	
	D			1																	
Chefoo	C			1	P		P														
	D			1																	
Foochow	C	P	P	P	P	P	P		P	P	P	P		P		P					
Hong Kong	C	3	1	2										1	1					3	
	D	3	1	2									1			1				1	
Manchuria—																					
Changchun	C	4					1									4					
Dairen	C				1	2				1			2	3					1		
	D				1																
Fushun	C	1		1		1															
Harbin	C	1								2		1				2					
Mukden	C	3			2	1										1		3	18		
Penshihu	C	1			1																
Shanghai—																					
Foreigners only	C														1	2		2			
Including natives	D														3	2	3			4	
Tientsin	C	11		4	13	8	4	1	2	2	2			6	20	10	10	8			
Curacao (Alastrim)	C														2				3		

Dutch East Indies:																					
Borneo—																					
Samarinda District	C					P															
South and East Borneo Residency	C		P																		
Java—																					
Batavia and West Java	C	2	4		4	25															
	D					15															
East Java and Madura	C	8	4	22	8	9	4	3	2			8	1	1							
	D				1																
Sumatra: Medan	C									3		8		1		3	5				
	D									2		1		2		4	4				
Egypt	C	4		3				4				4									
	D			1	1				1												
Cairo	C						1	1													
Great Britain:																					
England and Wales	C	721	568	508	473	902	283	366	230	212	255	247	275	398	405	370	386	369	369	392	
Birmingham	C		1		1										14	17	11	2	1		
Bradford	C					11	9	6	2	2	2	2	4	24	6	9	7	2	7	1	
Bristol	C				6	4	2	4	2							2		1			
Cardiff	C					1							1								
Leeds	C	2	5	3	7	5	3	3	6	4	4	6	1		1			2	1	2	
Liverpool														1							
London	C														2		1	5	10	1	
Manchester	C				3	6	2	5	10	8		1	2	2	11	6	4	4	1	4	
Newcastle upon Tyne	C	1	1	2	6	9	28	18	5	4	2	13	2	5	14	3	4	6	4	1	
Nottingham	C												7	6	4	8	6	9	6	1	
Sheffield	C	11	2	1	10	6	1	8			3		1	10	4		4		1	2	
Stoke on Trent	C		1										3	1			1		2	4	
Greece: Saloniki	D	1	2																		
Guinea (French): Beyla	C	9																			
India	C	11,340	5,911	4,398	3,153	4,052	1,031	1,556	1,939	2,205	2,225	2,502	2,664	3,285							
	D	3,140	1,668	1,120	715	927	307	359	465	519	515	578	551	785							
Bassein	C		1															1			
	D		1																		
Bombay	C	38	33	12	10	4		4		5		4	4	6	10	23	10	18	29	23	
	D	21	19	8	2	3		1		1					2	8	7	7	15	13	
Calcutta	C	93	27	22	5	5	4	3	11	7		17	9	14	14	11	23	10	9	18	
	D	70	25		6	2	2	1	6	2		17	4	6	10	7	10	7	5	11	
Madras	C	4	6	7	8	7	2	2	5	2	2		11	8	9	16	20	20	15	33	
	D	1		2		2	1	1	1		1		4	1	3	2	2	1	3	3	
Nagapatam	C	3	3	1										5		4	2	2	1		
	D	2	2	1										3		2	1				
Rangoon	C	37	14	9	17	6	5	2	1	6	36	28	23	40	41	34	108	97		82	
	D	11	3	2	3	1	1	1		2	5	13	4	9	13	10	18	23		24	
Vizagapatam	C	11		3									3		2	1	5	2		1	
	D	4		2											6	1		1			
India (French):																					
Karikal	C	2	3	1	2	P															
	D	2	3	1	2																
Pondicherry	C	22	39	37	38	42	15	6	6	14	6	16	25	18	15						
	D	20	31	37	38	42	15	6	6	14	6	14	12	18	15						
Indo-China: Saigon	C	1	1	1						1		1	1	1							

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C, indicates cases; D, deaths; P, present]

Place		July 3–30, 1927	July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	Mar. 3, 1928
Iraq:																					
Baghdad	C			1	7	5	1	5	7	12	9	9	3	2	7						
	D			1	4	4		5	4	5	7	3	2		3						
Basra	C	1	1	4	2	3		2	2			2									
	D	1	1	4	2	1		2	1			1									
Italy (Rome and vicinity)	C	1		1																	
Jamaica [1] (outside Kingston)	C	15	6	9	9	7	1		1	1		2				4		1	1	3	
Kingston	C			3	2																
Japan:																					
Nagasaki	C	17	2																		
	D	5	1																		
Tokyo	C														2	1					
	D															1					
Mexico:																					
Acapulco	C			2		1															
	D			2		1															
Chihuahua	D												1								
Guadalajara	D						1			1											1
Manzanillo	D													1							
Mexico City and surrounding territory	C						1	1	1	1							1	1	2		
Monterey	C	6																			
	D	4																			
San Luis Potosi	D	4	1																		
Tampico	C																				
Torreon	D		1		2															1	
Palestine: Jerusalem	C							1								1					
Paraguay	D	2																			
Persia: Teheran	D	2																			
Poland	C	7	2							1	5	1					1				
	D	2	1																		
Porto Rico [3]																					
Portugal:																					
Lisbon	C	4		3	8	4		3	3	4	1	2	4	5	5	2	2				
	D									1											
Oporto	C			1																	
Siam	C	34	51	27	6	1		8		1	2	5	8	8	13	7					
	D	9	10	15						1			2		1	1					
Bangkok	C	5		3		1		1				1	2								
	D	1		1									1								

Spain:																					
Malaga	D					1	1														
Seville	C													1							
Valencia	C				1							1	1								
Straits Settlements: Singapore	C					1															
Switzerland	C										2										
Tunisia: Tunis	C											2	2			3[1]					
Union of South Africa:																					
Cape Province	C	P	P		P																
Orange Free State	C		P			P	P	P	P	P	P				P						
Transvaal	C				P	7															
Venezuela: Maracaibo	D	1		2	1														1		

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1-10, 1928
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	
Algeria	C	376	459	382	682										
Oran	C	14	10	16	11										
Indo-China	C	19	3	21	25	13	3	22	10	4	20		40	18	
Syria:															
Aleppo	C										1		1		
Beirut	C								1		1			15	11
Damascus	C		3	5	22		13		4	6	2	11	2		

Place		July	August	September	October	November	December	January
Angola	C	42	2	5	73	71		
	D				2			
Congo	C			5	77			
Cuanza-Norte	C			1				
Cuanza-Sul	C				2			
Loanda	C			1				
Zaire	C			3	4	1		
Brazil: Porto Alegre	C	5	3	3	4	1		
British East Africa: Zanzibar	C				2			
	D				1			
Chosen	C	19	2		2	2		
	D	6				1		
Ecuador, Guayaquil	C		2	2	1	1	4	2
France	C	23	6	8	7	4	14	11
Gold Coast	C	1	1	5	4			

Place		July	August	September	October	November	December	January
Greece	C	3	3	4	4		5	6
Latvia	C				2			
Mexico	D	93	73	55				
Morocco	C	53	76	51	81	140	401	56
Nigeria	C	492	91	237	223	93		
	D	83	20	70	51	30		
Persia	D					2		
Spain: Madrid	D					1		
U. S. S. R.:								
Railways, etc	C	11	6	9	7	11		
Other territories in Europe	C	146	111	109	220			
Transcaucasus, Siberia, and Central Asia	C	36	29	15	40	21		
Ukraine	C	16	4	7	11	20		

[1] Smallpox reported as alastrim.

[2] An epidemic of smallpox near Fajardo, Porto Rico, was unofficially reported Mar. 12, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3–30, 1927	July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	February, 1928 4	11	18
Algeria:																			
Algiers	C															1			
Oran	C										1	1	1	1		2			
Austria: Vienna	C																1		
Bulgaria: Sofia	C				17	6				1	1	4	1		1				
	D					1													
Chile:																			
Antofagasta	D	1			1														
Talcahuano	D	1																	
Valparaiso	C	2		1		1	1	1						1					
	D		2	1		2													
China:																			
Manchuria—Harbin	C	3	2			1													
Tientsin	C	1		2															
Egypt	C	24	2		12	4	1	7	3	3	1								
	D	1	3		5			5	1	2									
Cairo	C								1	1									
	D								1										
Port Said	C				1			1											
Ireland (Irish Free State):																			
Cork County	C	1							3				1						
Donegal County, Letterkenny	C				4														
Mexico:																			
Guadalajara	D						1												
Mexico City, including municipalities in Federal District	C	16	17	19	18	28	7	6	4		4	4	4	3	2	1		2	1
	D					2				1	1	3	1						
Morocco	C												107	235	257	214	370	210	
Palestine	C	2	11	1	5	3	5	1	2	1				8		2	2		
Poland	C	99	50	35	19	64	13	28	17	35	26	33	68	68	101	92	87		
	D	10	6	2	4	11	1	5		4	1	3	6	6	4	3	5		
Portugal: Oporto	C		1			1												1	
Rumania	C	27	36	16	17	22	6	8	8	13	32	17	19						
	D	4	1		2							2	1						

Syria: Aleppo	C			[illegible]									[illegible]						
Tunisia	C	29	14	1	3	1				1	1			5	4				1
Union of South Africa:																			
Cape Province	C	P	P	P	P	P	P	P	P	P	P	1	P		P	P			
Natal	C	P	P	P	P	P	P	P	1	1	2	P	P	1		P			
Orange Free State	C	P			P				P										
Transvaal	C	18	1		5	P	P	P											

Place		1927 July	August	September	October	November, 1927 1-10	11-20	21-30	December, 1927 1-10	11-20	21-31	Jan. 1-10, 1928
Algeria	C	67	33	10	12							
	D	13			1							
Algiers	C	2	2	6	2							
Bulgaria	C	12	24	7	2						2	7
	D		1	2	1						1	
Morocco	C	148	76	7	11	5	14	7	5	6	75	
	D											

Place		July	August	September	October	November	December	January
Argentina	C					1		
	D						1	
China: Shanghai	D					1		
Chosen	C	72	17	1	16	26		
	D	8			1	2		
Chemulpo	C	1	2					
Gensan	C	2						
Seoul	C	2	3		2			
	D	1			1			
Czechoslovakia	C	6		6	1		6	
Greece: Athens	C	1		2			1	2
Japan	C	1						
Latvia	C	6						

Place		July	August	September	October	November	December	January
Lithuania	C	44	18	7	9	18	27	
	D	5	8	1	1	1	1	
Mexico	D	12	38	14	36			
Peru:								
Arequipa	D		2	1	2			
Lima	D	8						
U. S. S. R.:								
Railways, etc	C	30	22	25	23	33		
Transcaucasus, Siberia, and Central Asia	C	79	69	60	61	49		
Ukraine	C	96	85	114	151	198		
Other territories in Europe	C	732	552	555	521			
Yugoslavia	C	11	9		1	1		7
	D	4	1					3

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 29-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927				December, 1927					January, 1928				Feb. 4, 1928
							5	12	19	26	3	10	17	24	31	7	14	21	28	
Ashanti: Obuasi	C		1																	
	D		1																	
Belgian Congo: Boma	C														3					
	D														2					
Matadi	C														6	12	11	1	5	1
	D														2	6	8	2	5	
Dahomey: Grand Popo	C									1										
	D									1										
Porto Novo	C	1																		
	D	1																		
Ivory Coast	C	1												1						
	D	1												1						
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	9	16	6	6	7										
	D	3	9	21	31	8	10	4	4	6										
Dakar	C	1			12	3	6		5	2	1	4			1	1				
	D				7	2	4		4	2	1	4			1	1				
Togoland	C		1																	
	D		1																	

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

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SPECIAL ARTICLES

Current World Prevalence of Communicable Diseases

Recent Monthly Mortality Statistics of States

CO Gas Hazard from Automobiles in Streets and Shops

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

PUBLIC HEALTH REPORTS

VOL. 43 MARCH 30, 1928 NO. 13

CURRENT WORLD PREVALENCE OF COMMUNICABLE DISEASES [1]

United States, February 12–March 10, 1928

The mortality in large cities during the first 10 weeks of 1928 has been very favorable and has followed very closely that of last year. A slight increase occurred at the end of February as was to be expected, but the seasonal rise in mortality has been unusually slight. The annual rate for 68 cities for the 10 weeks ended March 10 was 13.8 per 1,000, which is the same as for the corresponding period of 1927.

Influenza.—The cases of influenza reported by 31 States increased at the end of February and beginning of March, but not sharply enough to indicate an epidemic situation. The reported cases averaged about 1,600 weekly for the first eight weeks, and the number increased to 2,163 cases in the week ended March 3 and 2,996 cases in the week ended March 10. The incidence has been very similar to that reported a year ago. In 1927 the seasonal maximum was passed in the week ended March 12, and in 1926, when the disease was epidemic, the maximum was passed a week later.

In certain Southern States, notably in Alabama, Arkansas, and Louisiana, the reported incidence of influenza has been somewhat higher than it was a year ago; but the number of cases has shown no tendency to rise continuously for several weeks in a characteristic epidemic curve. The influenza and pneumonia death rate by weeks up to February 18 also indicates a greater prevalence of respiratory conditions in the South Central States this year than a year ago; but in the remainder of the country, the weekly mortality from those causes has varied about the level of that in 1927.

Smallpox.—The prevalence of smallpox showed no further increase in the four weeks ended March 10, when 4,465 cases were reported by 42 States as compared with 4,618 cases in the preceding four-week period; but this is approximately 1,000 more cases than were reported in the corresponding four-week period a year ago. For the most part, the incidence of the cases in different parts of the country in the

[1] From the Office of Statistical Investigations, United States Public Health Service.

four weeks ended March 10 was unchanged as compared with the incidence in the preceding weeks.[1] The outbreak in Connecticut was promptly brought under control and only 10 cases were reported in the four weeks ended March 10, as against 126 in the preceding six weeks. An increase in cases is shown in the Arizona reports; 146 cases were reported in the four weeks ended March 10 as compared with 27 cases from January 1 to February 11.

Scarlet fever.—The number of cases of scarlet fever reported each week by 41 States continued to vary around 5,000 up to the week ended March 10. The disease has been less prevalent in the current year than at the corresponding season of last year, but a little more prevalent than it was two years ago. In none of the States does the incidence suggest any epidemic situation. The period of relatively high seasonal prevalence is rather wide in the case of scarlet fever and the disease may be expected to continue at the present level for several weeks.

Diphtheria.—The number of cases of diphtheria reported weekly by 41 States has been declining since the week ended February 4; in that week 2,250 cases were reported, whereas in the week ended March 10, 1,700 cases were reported. The maximum incidence occurred a little later in the present year than in either 1926 or 1927. The incidence in the current year has not differed significantly from that in 1927, but has been somewhat higher both in January and February than in the corresponding season of 1926.

Measles.—Measles cases continued to increase during February and the first part of March, and some further increase is likely, since the seasonal decline normally does not set in until quite late in the spring. There were 33,520 cases reported by 41 States in the two weeks ended March 10, as compared with 31,775 and 26,386 cases, respectively, in the two weeks ended February 25 and February 11. The incidence is still slightly above that reported last year, as was noted in the review of last month, but the number of cases is now smaller than the total reported by the same States in corresponding weeks of 1926, which was a "measles year." The reported incidence would seem to indicate that the disease is epidemic to some extent in the current year in about one-half the States scattered throughout the country.

Poliomyelitis.—There were fewer new cases of poliomyelitis in the four weeks ended March 10 than in the preceding four weeks, but more than in the corresponding weeks of either of the two preceding years. The 35 different States which reported one or more cases during this four-week period reported a total of 147 cases; California reported the largest number, 27 cases, Massachusetts

[1] Public Health Reports, Mar. 9, 1928.

reported 13 cases, New York reported 15 cases, and Oregon reported 9 cases.

Typhoid fever.—Cases of typhoid fever declined slightly during February; 41 States reported 118 cases in the week ended March 10, as against 215 cases in the week ended February 4. The disease has been less prevalent than in either of the two preceding years in most States.

Foreign Countries [1]

No unusual epidemic situation prevailed during December or January in any of the foreign countries for which the health section of the League of Nations had received reports. As in the United States, the general mortality in European towns reflected only a normal seasonal increase. Full official information on the widespread epidemic of influenza in Japan, which has been reported in the newspapers, is not yet available.[2] The prevalence for certain epidemic diseases is summarized below, chiefly from information taken from the League of Nations' Monthly Epidemiological Report

Cholera.—Port towns in the Far East which reported any cases of cholera during the five weeks ended February 4 included only Singapore, Bangkok, Saigon and Cholon, Samarang, and five towns in British India. Calcutta, with 123 deaths in these five weeks, and Bangkok, with 55 cases in four weeks of January, are the only towns reporting more than six cases or deaths in January. In Bangkok, a definite increase in the incidence of the disease during January is indicated; only one or two cases were reported weekly during November and December, but in January the number increased gradually, and 28 cases were reported in the week ended January 28.

An increase in cholera incidence in French Indo-China occurred at the end of December. In Annam, 174 cases were reported in the first 20 days of January, as compared with 22 cases in the month of December; in Cochin-China, 165 cases were reported in the same period, as compared with 113 in December. No increase had occurred in Cambodia, Laos, or Tonkin.

In India, the incidence of cholera declined steadily during December; 2,353 deaths were reported in the week ended December 31 as against 4,835 in the week ended November 26, but the deaths were still much above the normal for the season. The late autumn outbreaks in Bengal, Assam, Bihar and Orissa, and in Madras Presidency reached a maximum toward the end of November, and the disease declined rapidly in the succeeding weeks in each of these areas.

Plague.—The outbreak of plague at Aden, which began January 9, continued to spread, and up to February 11 there had been 197 cases

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[1] Data from the Monthly Epidemiological Report of the Health Section of the League of Nations' Secretariat, Feb. 15, 1928, supplemented by information published in the Public Health Reports

[2] See p 790. —Ed.

and 111 deaths reported. The number of cases increased each week and 89 cases were reported in the week ended February 11. One case occurred on January 19 at Baghdad, where there had been no plague since June. Five cases of plague were reported at Suez in the first five weeks of 1928, and these were the only cases reported in Egypt in this period.

No case of plague was reported in January from any Mediterranean port. Four cases were reported on the island of Teneriffe and three on the island of Las Palmas.

In Nigeria, the plague incidence in January continued lower than for several years past; 15 cases were reported in the five weeks ended February 4 as compared with 12 cases in the preceding five-week period. In the Union of South Africa, only 3 cases of plague were reported in January, all in inland districts, as compared with 6 cases in December and 9 in November.

The plague situation in India as a whole continued good in December, although there was a marked increase in cases about the middle of the month, followed by a drop to the previous level at the end of the month. The increase was due to a rapid spread of the disease in the United Provinces, as shown in the table below.

Plague cases reported in the United Provinces by two-week periods in the years 1924–1927

Year	Oct. 23–Nov. 5	Nov 6–19	Nov 20–Dec 3	Dec 4–17	Dec 18–31
1927	67	136	408	837	596
1926	60	200	312	421	285
1925	45	84	336	557	541
1924	280	316	580	783	799

The plague outbreak in the Madura district of the Madras Presidency also continued to increase in December. The plague incidence in most provinces was unusually favorable.

Since May, 1927, deaths from plague in Java have been somewhat more numerous than in 1926; the incidence remains, nevertheless, well below that of 1924 and 1925, when plague reached its greatest extension in Java. The disease continues to be most prevalent in the central part of the island; its incidence decreased in Kedu, which was the province most affected in 1926, but increased markedly in Pekalongan and Cheribon, both provinces on the northern coast.

Deaths in Java during the 20 weeks ended December 3

	1925	1926	1927
Java, total	5,683	2,599	3,342
East Java	141	14	101
Central Java	4,753	2,445	2,712
West Java	789	140	529

Plague was less prevalent in Peru in 1927 than in any year since its introduction in 1903. During the first 11 months of the year there were 188 cases and 62 deaths, as compared with 1,200 cases in 1926 and 418 cases in 1924, the previous low year. There were 14 cases and 4 deaths reported in December.

Plague incidence in Guayaquil has remained practically the same for several years. In January 4 cases were reported, and the number of cases varied from 3 to 9 a month for the preceding six months.

Two cases of plague were reported at Buenos Aires in the week ended February 11 and one each in Rosario and Santiago Province in the following week. Four cases had occurred at Rosario in January.

Yellow fever.—Yellow fever cases and deaths which were officially reported in West Africa in the past three years are shown in the accompanying table.

Yellow fever cases and deaths in West Africa, 1925–1927

Country	1925		1926		1927	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Ivory Coast	3	1	0	0	3	3
Dahomey	0	0	2	1	4	4
Upper Volta	0	0	2	2	0	0
Niger Territory	0	0	0	0	1	1
Senegal	0	0	27	23	116	109
French Sudan	6	4	5	4	0	0
Gold Coast	7	4	23	13	107	41
Nigeria	21	14	11	7	3	2
French Togo	0	0	0	0	8	8

A short summary of the history of yellow fever, of the more important scientific investigations that have been carried out, and of recent epidemics is published in the February Epidemiological Report.

Smallpox.—In England and Wales the seasonal increase in smallpox cases was quite marked during January, but the number of cases reported in the four weeks ended January 28 (1,461 cases) was considerably smaller than that for the corresponding period of 1927 (2,184 cases). The disease is prevalent over a larger area in the current year than was the case a year ago, having spread to a new center in South Wales and to the Midlands and southern counties.

Smallpox cases continued to increase in the French Protectorate of Morocco; 398 cases were reported in December as against 140 in November and 81 in October. In Algeria, where smallpox was widespread during 1927, the number of cases has been declining; only 39 cases were reported in the first three weeks of 1928 as compared with 154 in the preceding three weeks. In Tunis only 3 cases occurred between November 26 and January 21.

Returns for smallpox cases in India for November and December were considerably lower in 1927 than in 1926. Bengal, southern

Assam, Orissa, and eastern Bihar had, as usual in recent years, the highest incidence.

The noteworthy decrease in the smallpox incidence and case fatality rate in Java continued throughout 1927. During the first 48 weeks of that year there were 281 cases and 8 deaths, in comparison with 5,994 cases and 1,301 deaths in 1924, 4,652 cases and 508 deaths in 1925, and 819 cases and 87 deaths in 1926. The case mortality rate was 21.7 per cent in 1924, 10.9 per cent in 1925, 10.6 per cent in 1926, and 2.8 per cent in 1927. An active vaccination campaign has been carried out in recent years.

Typhus.—The number of typhus cases reported in Europe, excluding the Union of Socialist Soviet Republics, was about the same in 1927 as in the preceding two years. In Latvia, Poland, the Kingdom of the Serbs, Croats, and Slovenes, and Greece, the incidence decreased from 1925 to 1927, but it increased at the same time in Lithuania, Rumania, and Bulgaria. Fewer cases, however, were reported in December, 1927, than in the corresponding month of any previous year in all of these countries.

TABLE 1.—*Typhus cases reported in various countries of Europe and North Africa*

Country	1924	1925	1926	1927
Estonia	43	21	24	18
Latvia	290	96	72	30
Lithuania	618	221	325	450
Poland	7,706	4,196	3,568	3,059
Czechoslovakia	44	204	167	199
Hungary	229	33	10	5
Rumania	3,312	1,892	2,355	2,893
Kingdom of the Serbs, Croats, and Slovenes	319	388	199	117
Bulgaria	197	217	238	297
Greece	866	102	68	39
Total	13,624	7,370	7,026	7,107
Egypt	1,683	1,314	966	792
Tunis	209	404	423	413
Algeria	471	540	311	889
Morocco	----------	510	559	1,053

Typhus was less prevalent in the third quarter of 1927 than during the corresponding period of 1926 in the Central Industrial and Black So l Districts of the Union of Socialist Soviet Republics as well as in the Ukraine; the incidence was slightly higher, on the other hand, in northern and eastern Russia.

There was a marked increase of typhus fever in 1927 in Algeria and Morocco. During the first four weeks of 1928, 813 cases of typhus fever were reported in French Morocco, as compared with 111 in January, 1927.

Influenza.—There is no sign of any serious influenza epidemic in the January statistics of European countries. The number of deaths

attributed to influenza in large towns of England and Wales, which had been slowly increasing in December, began to decrease after the first week of January, an unusual occurrence. The number of deaths from influenza in German towns was low during the first two weeks of January. There was a slight increase in Paris, where 23 deaths were ascribed to influenza in December and 74 deaths in January.

There were 12 deaths from influenza in December at Madrid, 13 at Milan, 7 at Lyons, 6 at Prague, and 2 at Vienna, which shows a relatively low incidence for the season.

Measles.—Measles was moderately epidemic in most European countries during the last quarter of 1927, but the incidence was nowhere higher than is normally the case during the increases which usually occur every two or three years. The incidence in the third quarter of 1927 was lower than it was during the corresponding period of 1926 only in the Union of Socialist Soviet Republics, Estonia, Poland, Bulgaria, Greece, Albania, Malta, and Spain. The indications are that in many countries the maximum of the present winter will be passed earlier than usual.

Whooping cough.—Whooping cough shows no unusual prevalence in any of the countries for which information is available. The incidence was well below the normal during the fourth quarter of 1927 in England and in Denmark.

CURRENT STATE MORTALITY STATISTICS

For the information of public health officials and others interested, the data in the following tables have been taken from the monthly mortality reports of State health departments for the latest month for which published records are available. Statistics of most communicable diseases are not included, since they are available in other tabulations in the Public Health Reports. Statistics of deaths from other causes are limited for the most part to those causes which appear in the State reports. In the case of States which publish detailed mortality reports each month, the record of only the principal groups of causes and certain important specific causes have been used.

For purposes of comparison, the mortality records for the corresponding month in a few preceding years have been compiled. The rates have been computed upon the populations as estimated for July 1 of each year represented.

These tabulations will be enlarged as the current data on mortality from additional States become available.

Alabama

Death classification, by cause or age	December			
	1927	1926	1927	1926
	White		Colored	
	Annual rate per 1,000			
All causes	11.3	9.9	17.0	15.1
	Rate per 1,000 live births			
Infant mortality	65.8	(1)	91.8	(1)
	Annual rate per 100,000			
Influenza	43.7	24.4	67.1	38.1
Tuberculosis, all forms	48.8	36.2	147.4	172.2
Cancer, all forms	59.8	57.6	56.6	40.7
Diabetes mellitus	16.8	8.9	9.2	5.3
Cerebral hemorrhage, apoplexy	62.7	61.3	80.3	71.0
Diseases of heart	115.1	95.3	144.7	134.1
Pneumonia, all forms	136.3	85.7	155.3	107.8
Diarrhea and enteritis (under 2 years)	19.7	10.3	17.1	10.5
Chronic nephritis	79.4	76.1	128.7	97.3
Puerperal state	18.9	14.0	18.4	23.7
Congenital malformation and other diseases of early infancy	80.9	76.1	85.5	81.5
Automobile accidents	24.0	20.0	9.2	18.4
	Number of deaths			
Under 1 year	269	203	205	151
1-4 years	104	105	58	57
5-14 years	73	47	56	56
15-44 years	271	257	399	406
45-64 years	277	259	317	250
65 years and over	545	459	247	218
Age not stated	12	9	11	10

Connecticut

Death classification, by cause or age	December					
	1927	1926	1925	1924	1923	1922
	Annual rate per 1,000					
All causes	10.9	12.1	11.9	11.4	11.1	13.1
	Rate per 1,000 live births					
Infant mortality	66.6	66.6	72.4	60.2	66.2	81.9
	Annual rate per 100,000					
Influenza	21.5	26.4	26.9	33.7	16.8	22.0
Tuberculosis, all forms	57.9	82.3	69.3	76.0	89.4	90.3
Cancer	103.9	115.6	108.5	101.1	99.0	99.2
Diseases of the heart	186.3	216.8	205.5	166.9	145.3	(1)
Pneumonia, all forms	100.9	121.6	126.2	107.4	118.1	160.2
Diarrhea and enteritis (under 2 years)	7.4	7.6	16.2	8.6	12.8	13.8
Puerperal diseases	6.7	13.6	6.9	7.1	12.0	8.1
	Number of deaths					
Under 1 year	158	160	178	158	168	211
1-4 years	44	52	62	49	72	97
5-64 years	679	780	689	660	679	737
65 years and over	594	609	623	584	466	506

[1] Not available.

Indiana

Death classification, by cause or age	December 1927	1926	1925	1924	1923	1922
	Annual rate per 1,000					
All causes	11.9	12.1	12.4	11.8	11.6	12.2
	Rate per 1,000 live births					
Infant mortality	61.4	75.7	69.9	63.4	72.4	84.6
	Annual rate per 100,000					
Influenza	23.9	36.2	30.5	31.9	22.1	25.5
Tuberculosis, all forms	69.2	66.0	73.4	74.1	71.1	72.6
Cancer	102.0	96.5	105.8	94.5	90.9	95.9
Apoplexy	123.3	113.1	100.5	111.4	(1)	(1)
Organic heart disease	183.2	179.0	165.5	161.3	(1)	(1)
Pneumonia, lobar and broncho	117.0	120.6	139.6	117.9	92.8	140.1
Diarrhea and enteritis (under 2 years)	4.5	7.2	10.3	11.1	12.4	15.7
Bright's disease	74.8	75.4	72.3	99.5	(1)	(1)
Puerperal causes	9.7	10.6	9.1	5.9	[2] 5.0	[2] 3.5
	Number of deaths					
Under 1 year	294	350	332	324	355	417
1-4 years	96	124	114	96	123	227
5-14 years	70	75	103	80	119	115
15-64 years	1,289	1,253	1,269	1,233	1,212	1,117
65 years and over	1,423	1,396	1,433	1,340	1,172	1,235

New York State (exclusive of New York City)

	Death classification, by cause or age	December 1927	1926	1925	1924	1923
		Annual rate per 1,000				
1-205	All causes	12.8	13.3	15.0	14.7	13.4
		Rate per 1,000 live births				
	Infant mortality	72	72	73	77	80
		Annual rate per 100,000				
11	Influenza	13.3	13.5	16.7	22.6	9.3
31-37	Tuberculosis, all forms	62.3	73.1	95.3	80.1	85.6
43-49	Cancer and other malignant tumors	122.6	117.6	127.8	129.7	114.6
57	Diabetes mellitus	21.2	24.2	29.5	25.7	22.9
70-86	Diseases of the nervous system and of the organs of special sense	151.9	172.0	191.9	203.3	188.5
74	Cerebral hemorrhage, apoplexy	118.5	133.1	149.5	154.0	144.6
87-96	Diseases of the circulatory system	354.6	358.2	364.7	360.2	290.4
90	Other diseases of the heart	276.8	273.5	280.2	281.8	223.8
97-107	Diseases of the respiratory system	117.8	137.9	161.6	141.6	119.9
100, 101	Pneumonia, broncho and lobar	99.2	117.8	138.5	122.2	99.5
108-127	Diseases of the digestive system	68.6	74.4	81.3	81.4	87.5
113	Diarrhea and enteritis (under 2 years)	11.8	12.9	17.7	19.7	23.2
128-142	Nonvenereal diseases of the genito-urinary system	125.3	131.2	142.0	141.4	123.1
128, 129	Nephritis, all forms	115.1	121.3	129.2	128.5	109.2
143-150	The puerperal state	9.0	8.3	12.3	9.7	11.9
151-158	Diseases of the skin and of the bones and organs of locomotion	3.4	5.2	4.6	4.6	4.4
159-163	Malformations and diseases of early infancy	67.3	59.4	76.2	86.2	82.9
165-203	External causes	92.8	84.0	101.6	95.2	105.8
188c	Automobile accidents	19.7	12.7	20.6	16.8	24.1
		Number of deaths				
	Under 1 year	540	518	565	625	618
	1-4 years	147	155	195	174	174
	5-64 years	2,639	2,687	2,686	2,704	2,484
	65 years and over	2,649	2,739	2,738	2,585	2,234

[1] Not available. [2] Puerperal septicemia.

Tennessee

	Death classification by cause	December— 1927	December— 1926
		Annual rate per 1,000	
1-205	All causes	13.6	12 7
		Annual rate per 100,000	
11	Influenza	52.1	(1)
31-37	Tuberculosis, all forms	145.0	131.2
43-49	Cancer	64.4	(1)
100-101	Pneumonia, all forms	163.0	116.9
113	Diarrhea and enteritis (under 2 years)	14.2	14.8
146	Puerperal septicemia	5.2	(1)
188c	Automobile accidents	17.5	11.0

Michigan

Death classification by cause	November— 1927	1926	1925	1924	1923
	Annual death rate per 1,000				
All causes	11.6	12 6	11.6	10.7	[2] 12.4
	Rate per 1,000 live births				
Infant mortality	62.1	68.1	69.0	67.2	[2] 80

Pennsylvania

	Death classification by cause	November 1927	1926	1925	1924	1923
		Annual rate per 1,000				
1-205	All causes	11.5	11.7	12.0	12.0	11.8
		Rate per 1,000 live births				
	Infant mortality	64.2	72.1	74.1	(3)	(3)
		Annual rate per 100,000 [4]				
11	Influenza	19.5	19.8	21.6	19.8	14.0
31-37	Tuberculosis, all forms	63.4	65 3	68.7	72.8	71.0
43-49	Cancer	99.3	99.7	87.8	95.9	92.0
57	Diabetes	19.4	19.3	18.4	16.4	(3)
74-83	Apoplexy, softening of brain	88.1	91.2	68.9	(3)	(3)
87-90	Heart disease	225.0	214.0	199.0	(3)	(3)
100-101	Pneumonia, all forms	92 2	120.0	140.0	131.0	125.0
113	Enteritis (under 2 years)	22.4	22.9	25.4	31.4	29.0
128-129	Nephritis, all forms	97.8	106.0	105.0	108.0	(3)
143-150	The puerperal state [5]	4.7	5.9	6.3	(3)	(3)
159-163	Congenital malformations and diseases of early infancy [6]	34.7	36.2	35.7	(3)	(3)
188c	Automobile accidents	23.2	22.4	18.8	20.0	24.0

[1] Not available.
[2] United States mortality statistics.
[3] Not ascertainable.
[4] Except the puerperal state and diseases of early infancy.
[5] Rate per 1,000 total births.
[6] Rate per 1,000 live births.

New Jersey

Death classification by cause, or age	October					
	1927	1926	1925	1924	1923	1922
	Annual rate per 1,000					
All causes	10.5	10.2	11.3	10.5	11.0	10.8
	Annual rate per 100,000					
Influenza	5.0	5.4	5.2	4.3	5.8	4.6
Tuberculosis, all forms	70.7	66.2	68.4	74.5	80.7	85.2
Cancer	106.2	108.8	106.6	82.2	107.2	98.3
Diseases of the nervous system	99.9	119.7	125.3	120.0	111.3	123.5
Diseases of the circulatory system	229.9	211.6	224.4	199.2	197.9	174.2
Diseases of the respiratory system (pneumonia and tuberculosis excepted)	31.1	38.7	43.8	50.8	46.0	46.1
Pneumonia	32.0	33.3	54.9	45.8	33.7	37.3
Diseases of the digestive system	66.9	55.7	60.8	[1] 61.5	[1] 61.5	[1] 56.0
Infantile diarrhea	17.3	23.7	32.1	30.8	39.5	54.2
Bright's disease	90.8	94.7	101.1	92.9	98.9	92.9
Automobile accidents	29.5	23.7	(2)	24.7	28.5	(2)
	Number of deaths					
Under 1 year	332	335	419	409	435	489
1-4 years	107	113	143	139	143	186
5-59 years	1,559	1,427	1,526	1,381	1,444	1,348
60 years and over	1,338	1,304	1,374	1,223	1,165	1,054

[1] Infantile diarrhea excepted. [2] Not available.

New York State, 1927 and 1926

The following statistics are taken from the Health News of February 13, 1928, published by the New York State Department of Health:

Mortality in New York State in 1927 and 1926

Death classification by cause	1927	1926	Average 1922-1926
	Rate per 1,000		
Births	19.9	19.8	20.0
Deaths, all causes	12.3	13.4	12.9
	Rate per 1,000 live births		
Infant mortality	59	70	71
	Rate per 1,000 total births		
Stillbirths	40	42	42

Mortality in New York State in 1927 and 1926—Continued

Death classification by cause	1927	1926	Average 1922–1926
	Annual rate per 100,000		
Typhoid	1.7	2.6	....
Measles	1.6	8.4	....
Whooping cough	4.2	5.4	....
Diphtheria	8.6	6.4	....
Tuberculosis, all forms	81.9	89.1	....
Cancer, all forms	124.3	119.8	....
Diabetes	24.4	24.5	....
Alcoholism	8.1	8.1	....
Diseases of the heart	276.9	289.6	....
Bronchitis	5.0	7.0	....
Pneumonia, all forms	107.2	148.8	....
Diarrhea and enteritis (under 2 years)	13.1	17.4	....
Nephritis, acute and chronic	82.7	96.2	....
Suicide	16.0	14.3	....
Automobile accidents	21.2	19.7	....
Homicide	5.0	4.4	....
Accidents	80.7	82.5	....

Commenting upon these statistics, the Health News said:

The health of the people of the State of New York in 1927 was exceptionally good. The total number of deaths was less than a year ago by more than 10,000, mainly because of a lessened volume of mortality from tuberculosis, pneumonia, and diseases of the heart and kidneys. The death rate (12.3 per 1,000 population) was never lower and was equaled but once in 43 years. Infant mortality (59 deaths under one year per 1,000 live births) was the lowest recorded since 1904, when these deaths were first compiled separately. Mortality from most of the diseases of childhood, with the exception of diphtheria, also showed a gratifying decrease.

With reference to the decrease in deaths from diseases of the heart, the further comment is made:

We must not, however, ascribe too much significance to this decline because the high death rate in 1926 was directly influenced by an extraneous factor—the abnormally severe weather during the first months of the year. The present death rate from diseases of the heart, with the single exception of the preceding year, is still greater than ever before.

With respect to other causes, the Health News continues:

The death rate from pneumonia declined 28 per cent and the proportion of deaths due to this cause was only 8.7 as compared with 11.1 in 100 deaths last year. Here, too, we recall the very high mortality in February, March, and April, 1926. But, unlike diseases of the heart, the death rate from pneumonia in 1927 was, with one exception, the lowest ever recorded.

Cancer, with the highest mortality on record, is now second among the causes of death. A year ago it was third, in 1917 it was fifth, and 20 years ago it was eighth—being preceded in order by pneumonia, tuberculosis, diseases of the heart, acute and chronic nephritis, diarrhea and enteritis (under 2 years), accidents and cerebral hemorrhage and apoplexy.

The death rates from nephritis, acute and chronic, and from tuberculosis, all forms, have never been lower. The decline in the tuberculosis death rate was the greatest recorded in any one year since 1921 and the 1927 rate was one-half of the rate recorded only 10 years ago. The reduction in the death rate from

accidents was less than that which occurred in the mortality from all causes and the relative importance of this group has increased somewhat, from 6.2 to 6.6 per cent.

Ohio, 1927 and 1926

The following statistics are taken from the Ohio Health News of February 15, 1928, published by the Ohio State Department of Health:

Mortality in Ohio in 1927 and 1926

Death classification by cause	1927	1926
	Annual rate per 1,000	
All causes	11.2	12.2
	Rate per 1,000 live births	
Infant mortality	63	76
	'Annual rate per 100,000	
Typhoid fever	2.70	4.49
Smallpox	.15	.01
Measles	.55	12.51
Scarlet fever	2.36	2.92
Whooping cough	4.03	10.11
Diphtheria	7.78	7.51
Influenza	22.41	39.67
Acute poliomyelitis	2.56	.68
Meningococcus meningitis	.67	.51
Rabies	.17	.09
Tuberculosis, all forms	70.82	79.09
Other epidemic, endemic, infectious diseases	16.58	19.18
Cancer, all forms	98.53	100.31
Cerebral hemorrhage	101.60	110.15
Heart diseases, all forms	203.56	201.47
Broncho pneumonia	36.42	48.08
Lobar pneumonia	44.17	51.87
Diarrhea and enteritis (under 2 years)	13.42	22.91
Diarrhea and enteritis (over 2 years)	5.04	6.36
Nephritis	87.98	87.68
The puerperal state	10.36	13.08
Congenital malformation, deaths peculiar to early infancy	68.47	72.74
Suicides	13.13	13.59
Railroad accidents	9.56	9.63
Street-car accidents	1.93	2.42
Automobile accidents	22.05	20.63
Homicides	7.81	8.40
All others	265.79	277.97

The Ohio Health News, after pointing to the decreases in the general death rate and in the infant mortality rates, comments as follows:

Marked decreases in numbers of deaths were reported in the following diseases: Typhoid fever, measles, scarlet fever, whooping cough, influenza, tuberculosis (all forms), cancer, diarrhea and enteritis, and causes peculiar to early infancy. Causes of deaths showing increases were: Smallpox, diphtheria, acute anterior poliomyelitis, rabies, diseases of the heart, Bright's disease, and automobile accidents.

Only 40 of the 88 counties did not report deaths from poliomyelitis during the epidemic of last summer and fall. Eight counties reported deaths from smallpox and nine from rabies.

THE PROBLEM OF AUTOMOBILE EXHAUST GAS IN STREETS AND REPAIR SHOPS OF LARGE CITIES

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Nature of Problem

That automobile exhaust gas is highly poisonous has been established beyond question. Perhaps no other toxic substance has received so much attention of late, as indicated by the ever increasing literature on the subject. Scarcely a day passes without mention in the newspapers of a serious accident from automobile exhaust-gas poisoning occurring in garages. It is also well known that among garage workers chronic poisoning, or, perhaps, more correctly, continuous acute poisoning, is common. The seriousness of this hazard in public and private garages and repair shops has been recognized by health authorities throughout the country and is beginning to receive the serious consideration it justly deserves.

Due to the increasing number of automobiles, the problem of the pollution of the air of city streets has come to the fore and many hygienists express deep concern over this problem. Certain types of automobiles of large gasoline consumption, such as trucks and omnibuses, are becoming almost as numerous in the streets of large cities as pleasure cars; and with the new systems of traffic control in vogue in the cities, much starting, stopping, and idling of engines has become necessary. All these factors are conducive to the greater production of exhaust gas, so that at times a haze of blue smoke may actually be seen hanging over the streets of some of our cities. The smoke and its accompanying smell of burnt oil are not, however, an index of the toxicity of exhaust gas. It is generally agreed that the most dangerous substance issuing from the exhaust of an automobile is carbon monoxide, a very subtle poison, in that it is colorless and practically odorless, although usually present in automobile exhaust gas in high concentrations. Carbon monoxide is highly poisonous, because it displaces the oxygen from the hemoglobin molecule, causing asphyxia of the tissues. Most authorities on the physiology of carbon-monoxide poisoning believe that all of the clinical manifestations arising from the breathing of carbon monoxide may be explained on the basis of oxygen privation.

The amount of carbon monoxide produced depends chiefly upon the adjustment of the carburetor, as shown by the investigators of the United States Bureau of Mines (1). In connection with the problems involved in the ventilation of the vehicular tunnel now operating under the Hudson River between New York City and New Jersey, it was necessary to determine the amount and composition of exhaust gas from automobiles. The workers of the

Bureau of Mines undertook this problem and made road tests on 101 automobiles and trucks operated under all sorts of conditions, which showed that the carbon monoxide varied from 0.5 to 14 per cent of the total exhaust gases, averaging about 7 per cent and, under certain conditions, reaching even higher concentrations. This is true when a car is idling. For example, while waiting for the traffic control to change, drivers often use the accelerator several times, presumably to prevent their engines from stalling. This practice yields relatively high amounts of carbon monoxide and smoke.

The air we breathe is a remarkable diluent of the toxic gases that are constantly being emitted from various sources associated with our industrial life. Whether or not there is sufficient air to dilute the vast quantities of toxic automobile exhaust gas at certain congested areas in our large cities where stalled traffic is a common occurrence, is a problem that concerns us at the present time. That the amount of visible smoke and smell emanating from automobile exhausts is at times disagreeable is a fact not to be disputed; but whether or not the amount of exhaust gas in the air of our congested cities is such as to be inherently unhealthful is a question still to be decided.

In order to evaluate the extent of the hazard involved it is essential to determine the amount of carbon-monoxide gas present in the air of the most congested traffic areas of our cities. Such determinations made under traffic and atmospheric conditions should yield a fair index of the amount of toxic gas to which individuals are daily exposed in our streets, and an analysis of such data viewed in the light of our present day knowledge concerning the toxicity of carbon monoxide should go a long way toward answering the question as to whether or not a hazardous condition now prevails in our city streets. It is with such a study of the amount of carbon monoxide present in the atmosphere of our large cities that this paper is mainly concerned. Tests for carbon monoxide in automobile repair shops were also conducted and yielded some interesting results.

Previous Studies

Numerous tests have been conducted in recent years by various investigators in connection with the amount of carbon-monoxide gas existing in the atmosphere of garages and automobile repair shops. One of the most recent and extensive investigations of this sort was the one made by workers of the Bureau of Industrial Hygiene of the New York State Department of Labor (2). However, very few studies have been made concerning the amount of carbon-monoxide gas present in the outside air of our cities. In 1923 Henderson and Haggard (3) reported the conditions in the streets of New York and New Haven as regards atmospheric pollution by automobile exhaust

gas. These investigators made numerous tests under a great variety of atmospheric and traffic conditions. They concluded that a definite hazard existed in the congested areas of our large cities, and they recommended the vertical exhaust pipe discharging above the breathing level as a means of amelioration.

It appeared from this study that traffic patrolmen would be the persons most likely to be affected by exhaust gases in streets; and in 1926 Wilson, Gates, Owen, and Dawson (4) reported blood tests made on traffic patrolmen in Philadelphia. These workers examined the blood of traffic patrolmen after an ordinary eight-hour day's work, and found it to contain from 0 to 30 per cent carbon-monoxide hemoglobin, enough to be associated in some cases with mild subjective symptoms.

The only other study of carbon monoxide in city streets with which we are familiar is that made by workers of the Bureau of Sanitary Engineering of the Department of Health of the city of Chicago (5). In a report issued in 1926 these investigators presented results of tests made of the air in various parts of the city of Chicago. The highest amount of carbon monoxide reported by these workers was 0.36 part per 10,000 parts of air. From this study it was concluded that no hazard from carbon monoxide existed in the streets of Chicago.

Scope of Study

Early in 1927 one of the authors of this paper was engaged in certain work which necessitated visiting some of the large cities in this country, from Boston to San Francisco. It was thought that this trip, embracing all of the largest cities, offered a spendid opportunity to study the amount of carbon monoxide present in the most congested areas of these cities. Such a study would take in variations in traffic control and atmospheric changes which exist in our municipalities, and would yield an excellent index of the extent of atmospheric pollution by automobile exhaust gas.

Since the desideratum of these tests was to study conditions when the hazard was at a maximum, it was decided to include also automobile repair shops for indoor tests. In each city two repair shops, considered as representative of such establishments in the community, were selected for the tests. In addition to obtaining samples of air for the determination of carbon monoxide, a detailed study was made in each place concerning such influencing factors as artificial and natural ventilation, floor space and cubic content of each shop, number of automobiles handled in a day, number of workers exposed, and any other data bearing on this problem. In certain instances the blood of workers was examined in order to determine the degree of carbon-monoxide-hemoglobin saturation.

Likewise, for the street tests, it was desired to study the extreme existing conditions. Hence, with the aid of the police department of each city, two or three of the most congested traffic intersections were selected and tests made at the time when traffic was at a maximum, usually between the hours of 4 and 6 in the afternoon. Most of the street samples were taken at a time when traffic was stalled and cars were idling. These samples were taken as a rule at the breathing level of the pedestrian standing at the curb, and were obtained some 20 or 30 feet from the street intersection, in order to be where idling cars were numerous and also to avoid the open area at the street crossing. Where there was a police officer in the roadway of the intersection, samples were taken beside him in order to determine his exposure to the gas. In connection with the street tests, such factors as the distance between building lines, height of buildings, volume of automobile traffic, wind velocity, temperature, and relative humidity were also recorded. A few tests were made in tunnels used by vehicles and pedestrains, at taxicab stations, and (in one city) inside of auto busses and in offices and residential apartments opening on congested thoroughfares.

All samples were of the so-called "snap" or "grab" instantaneous type, and were taken by breaking the sealed tip of an evacuated 500-cubic-centimeter glass bulb. After obtaining the sample in this manner the broken capillary tip was temporarily sealed with sculptor's clay ("plasticine"), and upon arrival at the laboratory the bulb was sealed in a flame and stored away for subsequent analysis. It was felt that practically no loss of gas was possible in using this technique. Such instantaneous samples taken under congested traffic conditions necessarily yield higher results than would the slower continuous samples taken by other methods; but, since it was desired to study conditions when the exhaust gas in the air was at a maximum, this method of sampling appeared to us to be the most practicable. Our survey commenced in February and continued until late in June of the year 1927, so that all sorts of atmospheric conditions were encountered, thus yielding a fair test of atmospheric pollution by automobile exhaust gas.

Method of Analysis

The iodine pentoxide method was used for the analysis of our samples. This consists essentially in absorbing the other interfering substances in the air sample, oxidizing the carbon monoxide with iodine pentoxide, and determining the amount of iodine liberated. The apparatus used was similar to that of Seidell and Meserve (6), and differs only in the addition of a liquid-air condenser. In 1920

Teague (7), in working out a method for the determination of carbon monoxide in air contaminated with automobile exhaust gas, showed that the only effective means of removing unburned gasoline (which he found to be the only substance vitiating the result of the analysis of carbon monoxide by the iodine-pentoxide method) was in the use of liquid air (−190° C.), which freezes out not only gasoline vapors but also water, carbon dioxide, and probably all of the unsaturated hydrocarbons.

Essentially the method is as follows: Suction is applied at one end of the absorption train in such a manner as to displace (by water) the sample of gas to be analyzed. The carbon monoxide, after passing through the various absorption bulbs and the liquid-air tube, is oxidized by iodine pentoxide at 150° C., and the liberated iodine is absorbed in a solution of potassium iodide. After the absorption train has been swept out by means of carbon-monoxide-free air, the total iodine obtained is titrated with N/500 sodium thiosulphate. The method is rather exacting, but under carefully controlled conditions it yields an accuracy of 0.1 part of carbon monoxide in 10,000 parts of air.

A number of analyses were made of artificial mixtures of air with known amounts of carbon monoxide or gasoline vapor, or both, in order to check the method. The mixtures of carbon monoxide were made by introducing a known amount of carbon monoxide from a gas burette into a known quantity of air. The carbon monoxide was prepared by the action of concentrated sulphuric acid on sodium formate, was purified by bubbling through a barium-hydroxide solution, and was subsequently stored over water. A saturated mixture of gasoline vapor with air was made by shaking 50 cubic centimeters of gasoline in a 2-liter bottle for five minutes. Definite volumes of this were taken with a gas burette after the air-gasoline mixture had stood for half an hour at room temperature. A series of analyses was made in order to test the efficiency and the necessity of using the liquid-air tube to remove unburnt gasoline vapor. Known mixtures of air, gasoline vapor, and carbon monoxide were analyzed, both with and without the liquid-air cooling tube in the train. The results of this series of tests are shown in Table 1.

This experiment demonstrated that it was necessary to remove any gasoline vapor in the determination, and that this removal was accomplished satisfactorily by the use of a liquid-air cooling tube. The determinations of carbon monoxide presented in Table 1 were lower than the theoretical in all cases except in the experiment where the gasoline vapor was not removed by the use of the liquid-air tube. These low results are probably due in part to the fact that the carbon monoxide was not strictly pure. The values which were obtained

on gasoline and carbon-monoxide-air mixtures when liquid air was used are in accord with those obtained in the absence of gasoline vapor.

TABLE 1.—*Showing effect of using the liquid-air condenser tube when determining carbon monoxide in air contaminated with gasoline vapor*

Type of absorption train used	Cubic centimeters of air saturated with gasoline	Cubic centimeters of CO in air mixture calculated	Cubic centimeters of CO found	Difference in per cent
Without liquid air tube	0	1.0	0.95	−5
	0	1.0	.93	−7
	100	1.0	24.30	+2,430
With liquid air tube	0	1.0	.92	−8
	0	1.0	.83	−17
	100	0 0	.00	0
	10	1.0	.91	−9
	10	1.0	.81	−19

CO-free air was used to make the mixtures in all cases.

A series of determinations was also made upon dilute mixtures of carbon monoxide and air. The deviations were less than 3 per cent in mixtures containing 1 to 6 parts CO per 10,000, and less than 10 per cent in those containing about 0.5 part per 10,000.

In all, 250 tests were made for carbon-monoxide gas in the air of streets, repair shops, and auto busses. Of this number, 141 were made in city streets, 102 in repair shops, and 7 in auto busses. In certain instances in which the analysis of a sample showed a relatively small amount of liberated iodine (corresponding to a low CO content), the contents of two or more sample tubes were combined for analysis in order to yield a higher relative degree of accuracy in the subsequent titration. In general, sampling tubes were "pooled" only in those cases in which the samples were obtained at the same location, and where the total amount found was low.

Street Tests

Table 2 summarizes all the tests for carbon monoxide made in the streets of 14 large cities. As has been stated, these tests were usually made at the most congested traffic intersections and at the time of day when traffic was at a maximum. Nearly all samples were taken at the breathing level of a pedestrian and at various points in the street where it may be necessary for a person to walk, such as at the curb near automobiles waiting for the signal to start, in the middle of the road, and near the traffic officer's position. It is felt that these samples represent high average exposures for pedestrians to automobile exhaust gas.

TABLE 2.—*Summary of carbon-monoxide tests made in the streets of 14 cities*

City	Sampling location	Number of tests made	Average CO in parts pe 10,000 of air	Distance in feet between building lines	Average number of stories of buildings affecting air currents	Volume of automobile traffic, cars per hour	Wind velocity in miles per hour	Per cent relative humidity	Remarks
A	6	5	0 3	90	--------	--------	0.6	40	
	8	4	.9	90	--------	--------	1.1	71	
B	10	6	1.2	150	--------	1,400	.2	67	
	13	6	.3	70	--------	2,400	.3	78	
C	17	4	.8	84	--------	1,720	.4	68	
	19	4	.6	80	--------	5.400	--------	71	
	20	4	1.7	32	--------	--------	--------	--------	Fan-ventilated tunnel 1,040 feet long by 33 feet wide by 20 feet high.
D	21	4	.9	50	--------	700	2.5	46	Naturally ventilated tunnel 911 feet by 50 feet by 19 feet.
	24	4	.7	64	--------	1,500	.7	48	
	25	4	.4	64	--------	900	1.1	78	
E	29	4	.3	60	--------	1,500	.4	62	
	31	5	.5	74	--------	1,700	.6	53	
F	39	4	1 7	84	--------	3,000	.8	39	
	42	6	.5	70	--------	1,320	--------	57	
G	46	4	.2	150	--------	2,020	.6	20	
	48	4	.6	125	--------	1,960	--------	42	
H	53	3	.7	58	12	1,250	8.0	55	
	56	3	.4	60	3	1,300	0	55	
	57	2	2.9	82	--------	800	0	42	Taxicab station, tunnellike inclosure.
I	60	5	.3	125	6	2,480	4.0	51	
	61	6	1.5	130	10	2,610	1.5	42	
	Misc.	3	1.1	--------	--------	--------	--------	--------	Taxicab station and office.
J	65	6	.2	82	10	3,990	15.0	69	
	66	3	.8	115	2	1,370	5.0	61	
K	72	5	.6	112	8	1,576	2 0	40	
	73	4	1.1	106	8	2,202	8.8	30	
L	76	5	1.2	95	8	2,210	3.3	59	
	77	5	.5	73	5	1,720	1.7	40	
M	82	4	.7	105	3	1,990	4 2	26	
	83	3	.2	92	3	1,810	7.0	48	
N	90	3	.3	72	2	3,470	6.0	55	
	93	5	.3	110	2	2,780	2.0	51	
	Misc	4	.6	--------	--------	--------	--------	--------	Samples taken from rear of truck while in motion through city streets
Totals	33	141	25.0	754	82	57,078	72 8	1,570	
Average	2 4	4.3	.8	85	5.9	2,038	2.7	52.3	

Table 2 presents the number of tests made at each sampling location and the average amount of carbon monoxide, in parts per 10,000 parts of air, found at each sampling spot, the distance between building lines, height of neighboring buildings, the volume of traffic, wind velocity, temperature, and relative humidity. It is to be noted that attempts to find a relation between carbon-monoxide concentration and such factors as wind velocity and traffic volume proved fruitless, though the lowest concentration was found at the point of highest wind velocity, and another low result was obtained in the widest thoroughfare. Possibly a larger body of data might reveal more definite correlations; but, apparently, one or two poorly adjusted carburetors are likely to produce high contamination in spite of the benefits derived from a strong breeze and a clear day.

The average carbon-monoxide concentration at 30 open street locations in 14 cities was found to be 0.65 parts per 10,000. The minimum average amount at any location was 0.2 and the maximum was 1.7 parts per 10,000. A result as high as the maximum for street air was obtained in a vehicular tunnel ventilated by fans, the average amount of carbon monoxide here being 1.7 parts per 10,000. This condition is partly due to the fact that at one of the tunnel exits there is a traffic signal which delays some of the cars for a period as long as 30 seconds; this results in a long line of halted automobiles half the length of the tunnel. This condition could be considerably minimized by providing for freer exit from the tunnel or by controlling the idling of engines in the tunnel during the period when cars are not in motion. At another location we obtained a still higher concentration of carbon monoxide. Our analyses showed that in this location, which is an inclosed tunnellike taxicab stand at a railway station, there existed 2.9 parts of carbon monoxide per 10,000 parts of air. Taxicabs are usually not provided with self-starters, so that once the motors are started it is customary in some instances not to shut them off during the entire working day. This practice obviously increases the amount of carbon-monoxide gas in the air of such places as cab stands at our large railway terminals.

In one city samples were taken in a narrow residential street where cars are continually passing, and on one floor above the sidewalk in an apartment opening on this street, and in an office located on the fourth floor of a building overlooking the congested traffic area The sample taken in the narrow street showed 0.2 parts per 10,000 of carbon monoxide and the sample taken in the room one story above showed 0.4 parts per 10,000. In the office room on the fourth floor of a building located in the business area of the city 0.3 parts per 10,000 of carbon monoxide was found.

Repair Shop Tests

In Table 3 is presented a summary of the tests made in 27 automobile repair shops in 14 cities. In all, 102 determinations were made in these shops. The average amount of carbon monoxide found was 2.1 parts per 10,000 parts of air. Additional data included such information as area of available openings in the room that might serve as a means of natural ventilation, area of ventilating space actually open at the time the tests were conducted, number of automobiles entering and leaving in a day, number of workers exposed, and the presence of artificial ventilation in the workroom.

The data presented in Table 3 show that the highest average amount of carbon-monoxide gas found in any repair shop was 11 parts per 10,000, while the minimum average was only 0.1 part per 10,000. The ratio of available openings to floor space averaged 0.07, and about 43

per cent of the available openings were in use at the time these tests were made. The average number of cars handled was 80 and the average number of persons exposed was 23. Practically all the shops visited depended on natural ventilation to remove the toxic gases produced by automobiles.

TABLE 3.—*Summary of carbon-monoxide tests made in automobile repair shops of 14 cities*

City	Repair shop	Number of tests made	Average CO in parts per 10,000 of air	Ratio of available openings to floor space	Ratio of actual openings to floor space	Number of automobiles handled per day	Number of workers exposed	Principal ventilation	Remarks
A	5	4	0.1	0.11	0.04	25	7	Natural	
	7	4	1.2	.08	.01	120	4	do	
B	9	4	.8	.05	.03	100	23	do	
	11	3	.1	.15	.11	12	5	do	
C	15	4	2.3	.07	.03	15	12	do	
	16	4	.6	.04	.03	40	30	Mechanical	Duct system of exhaust ventilation.
D	23	4	1.2	.04	.02	150	5	Natural	
E	28	4	3.3	.22	.03	50	15	do	Low-pressure exhaust fan.
	30	4	11.0	.10	.012	35	10	do	
F	40	5	4.1	.03	.02	115	330	do	
	41	4	1.8	.21	.00	15	8	do	Flexible pipes (leaking) attached to muffler outlets.
G	43	3	1.0	.04	.014	130	35	do	
	45	3	1.9	.05	.02	50	18	do	
H	52	4	2.7	.06	.02	35	37	do	
	55	4	.7	.07	.05	80	15	do	
I	58	4	.6	.01	.004	30	52	do	
	59	2	.7	.02	.006	40	30	do	Low-pressure exhaust fan.
J	63	4	.9	.03	.03	45	75	do	
	68	2	.2	.05	.04	7	46	do	
K	70	4	.6	.01	.009	100	50	do	
	71	6	2.6			600	200	Mechanical	Ducts exhausting only 100 cubic feet per minute, near the muffler outlets. Ozonator in use.
L	78	5	8.3	.04	.03	25	5	Natural	
	79	5	4.3	.07	.05	30	10	do	
M	86	3	1.0	.18	.13	35	15	do	
	87	4	.5	.01	.013	100	4	do	
N	91	3	.7	.04	.03	100	30	do	Flexible pipes attached to muffler outlets.
	92	2	2.4	.06	.05	90	50	do	
Totals	27	102	55.6	1.84	.80	2,144	617		
Average	2	3.8	2.1	.07	.03	80	23		

All attempts to obtain a correlation between the amount of carbon monoxide and the ventilation factors, such as area of openings, method of ventilation, and number of cars handled, failed to give any decisive results. We are convinced that the idling of a car at the time of sampling produces such a large amount of carbon monoxide as to destroy all the relationships which might be assumed to exist between ventilation and gas content of the garage or repair shop. In fact, from our observations during this study it is felt that no matter what type of ventilation is in use in a repair shop, the carbon-monoxide concentration will be excessive so long as motors are allowed to discharge their exhaust indoors for any considerable

length of time. It is a practice in most shops to test carburetors indoors, a practice that is obviously productive of much exhaust gas. It seems that this gas could be eliminated effectively by relatively simple means. One such simple system was found in use in a repair shop in one of the cities visited. Cars entering the shop were obliged to shut off the motor within 30 seconds after admission. Whenever any carburetor adjusting was to be done, a flexible hose was firmly attached to the exhaust pipe. This hose extended up to the ceiling and was connected to a pipe leading to a ventilator on the roof. With such an arrangement the hot gases pass out through the ventilator.

To test the efficiency of such a system, air samples were taken as follows: An automobile had been placed on the testing block for carburetor test, with its exhaust pipe attached to the flexible hose connection which led to the ventilator in the roof. Three samples taken at the breathing level of the observer immediately after the testing of the engine averaged 0.7 parts of CO in 10,000 parts of air. Five minutes after this test the same automobile engine was allowed to idle without the hose connection to the exhaust pipe, the gases coming out into the shop in a horizontal stream. Samples taken under these conditions averaged 2.0 parts of CO in 10,000 parts of air for periods of engine operation corresponding to those of the first test. This difference in CO content of 1.3 parts per 10,000 is an indication of the efficiency of the simple and inexpensive system of exhaust gas removal described above. It is often argued that such a system would not be practicable in shops where most of the gas comes from cars in motion. This fact may be true in commercial garages and storage places, but was not found to be so in repair shops. In nearly all instances an automobile once brought into the shop remains in one location until repairs have been completed. It is our belief that most of the gas is produced during carburetor testing when the car is not in motion, and at such a time the flexible pipe connection attached to the exhaust should serve to conduct all noxious gases outside the repair room.

In several cities, information was requested by repair-shop proprietors concerning the advisability of the use of an ozone apparatus for eliminating carbon-monoxide gas. Such an apparatus has been investigated by the Bureau of Industrial Hygiene of New York (8), and the conclusion reached by the investigators of that bureau is that ozone does not oxidize carbon-monoxide gas to any appreciable extent. The effects of the ozonator on carbon monoxide were first tested by the New York Bureau of Industrial Hygiene in a gas-tight chamber, and, later, further tests were made in service stations where all determinations showed carbon monoxide to the extent of 3 or 4 parts in 10,000. In an automobile plant visited by us an ozonator was in use in a portion of a large one-story building devoted to

the final assembling and testing of automobiles. As many as 10 machines were tested at one time. An attempt was made to remove some of the exhaust gases by means of local ducts placed within a few inches of the exhaust pipe of each machine and connected with a low-capacity exhaust fan. These ducts were rectangular, about one-third of a square foot in cross-sectional area and removed only about 100 cubic feet of air per minute. The design and location of the exhaust ducts were such as to allow most of the gas to escape into the air of the room. Six tests for carbon-monoxide gas made in the vicinity of the ozonator and test racks showed an average of 2.6 parts per 10,000 parts of air. Blood tests, using the Sayers-Yant pyrotannic acid method (9) were made on five men employed in this room. Three of the men had been working at the test racks for about three hours, and an analysis of their blood taken while at work showed 20, 25, and 20 per cent carbon-monoxide-hemoglobin saturation. A test on the blood of one man working 100 yards away from the test rack showed 15 per cent carbon-monoxide hemoglobin, and the blood of another person employed on final assembly work 50 feet away from the test rack showed 25 per cent carbon-monoxide hemoglobin. This amount of carbon-monoxide hemoglobin is associated with mild subjective symptoms. Possibly the only effect of the use of the ozonator is a psychological one.

Autobus Tests

In two cities, tests were made inside autobusses. Nearly all such conveyances are heated during cold weather by allowing the hot exhaust gases to pass through pipes located on the floor alongside the walls of the car. In case there are leaks in these pipes some exhaust gas will find its way into the bus. The several busses in which tests were made by us showed the presence of exhaust gas by their odor, which in an overheated bus is at times disagreeable. Practically all these busses depend on small openings in the roof or sides of the car for natural ventilation. In seven tests made in six different autobusses, the maximum amount found was 1.0 part of carbon monoxide per 10,000 parts of air, the minimum was 0.1 part, and the average of the seven tests was 0.5 part in 10,000. It was noted that some of the busses at the time these tests were made were overheated, a condition which does not promote comfort and which may increase the symptoms of mild carbon-monoxide poisoning.

Discussion of Results

In Table 4 the results of all our tests for carbon monoxide in streets, repair shops, and autobusses of 14 large cities are summarized in such a manner as to show the percentage distribution of samples according to the concentration of carbon monoxide found. It is apparent that

only 24 per cent of the street samples showed as much as 1 part of carbon monoxide per 10,000 parts of air, whereas 59 per cent of the repair shop samples fall into that group. Of the seven autobus samples only one contained as much as 1 part of carbon monoxide in 10,000 (1.0). Of the 34 street samples (24 per cent of the total street samples) which contained 1 part or more of carbon monoxide in 10,000, 32 (23 per cent of total) had less than 2 parts and 2 (about 1 per cent) contained 2 parts or more of carbon monoxide in 10,000 parts of air. These highest concentrations, however, were obtained in a taxicab station at a railway terminal, and present an unusual condition. It must be noted also, that our street samples tend to represent the worst conditions in streets as regards carbon-monoxide content, since they were obtained in nearly all instances at the most congested traffic centers and at the busiest hours of the day, when the volume of traffic was at its height. The samples were, it should also be noted, of the instantaneous type and taken, as a rule, when traffic was halted and engines were idling, a condition associated with the maximum production of exhaust gas. The autobus samples show a still more favorable result in that practically all of them contained less than 0.01 per cent of carbon monoxide.

On the other hand, the samples taken in the 27 repair shops of the 14 cities show a condition far from favorable. More than half of the samples (59 per cent) contained more than 1 part of carbon monoxide in 10,000, and 18 per cent were over 4 parts in 10,000, an amount considered as decidedly inimical to health. In fact, several determinations in repair shops showed 10 or more parts of carbon monoxide in 10,000. These high results were usually obtained in those repair shops of small floor space, low ceilings, and very small openings to the outdoor air.

TABLE 4.—*Distribution of carbon-monoxide samples obtained in city streets, repair shops, and autobusses*

Carbon monoxide in parts per 10,000	Street samples		Repair shop samples		Autobus samples	
	Number of samples	Per cent of samples	Number of samples	Per cent of samples	Number of samples	Per cent of samples
0.1-0.9	107	76	42	41	6	86
1.0-1.9	32	23	21	21	1	14
2.0-3.9	2	1	20	20	0	0
4.0+	0	0	19	18	0	0
Total	141	100	102	100	7	100

At the present time the accepted criterion concerning the safe limits of carbon-monoxide concentration in air is that advanced by Henderson and his colleagues (10) in 1921 as a result of their work on the physiological effects of automobile exhaust gas for the New York

and New Jersey State Bridge and Tunnel Commission. These workers stated that for the tunnel itself a standard allowing a mix-imum of 4 parts of carbon monoxide in 10,000 of air would be permissible provided the transit through the tunnel would take less than one hour. In summarizing their findings, Doctor Henderson and his collaborators formulated the following general rule: When the time is measured in hours and the concentration of carbon monoxide is expressed in parts per 10,000 parts of air, the physiologic effects may be defined by the equations:

Time × concentration = 3, no perceptible effect.
Time × concentration = 6, a just perceptible effect.
Time × concentration = 9, headache and nausea.
Time × concentration = 15, dangerous.

This work of Henderson's was subsequently confirmed by Sayers, Meriwether, and Yant in 1922 (11). These workers studied the effect of long exposure to low concentrations of carbon monoxide, the effect of strenuous exercise, and the effect of high temperature and humidity in low concentrations. Sayers and his colleagues showed that when a subject exercised strenuously for one hour in an atmosphere containing 2½ parts of carbon monoxide in 10,000 the immediate symptoms of carbon-monoxide poisoning were moderate and the after effects mild to moderate. None of the subjects showed any permanent effects after repeated exposures to carbon monoxide.

From the foregoing discussion of the amount of carbon monoxide that may be tolerated with impunity it is quite obvious that our findings concerning the conditions in the streets of large cities do not reveal a serious condition. Under ordinary circumstances a pedestrian would be exposed to the maximum condition only for a brief period, and even then the concentration of carbon-monoxide gas he would be forced to inhale would be rather low, our findings showing an average carbon-monoxide content of 0.8 part in 10,000 for 141 samples taken when the possible hazard was at a maximum. The same criterion applied to autobus samples shows that there ordinarily exists no hazard due to the contamination of the atmosphere inside such conveyances. It is conceivable, however, that the air of busses may be subject to an even greater range in carbon-monoxide content than that of streets or large garages, since a single badly leaking exhaust pipe discharging continuously into the interior of a bus could produce relatively high concentration. The only person who may be considered on the border-line in connection with outdoor poisoning from automobile exhaust gas is the traffic officer, who is obliged to remain at his post for about eight hours, during two hours of which period the exposure reaches a maximum. That there is a possibility of some grounds for the belief that traffic officers are affected is brought out by Wilson and others (4) who tested the blood of patrolmen after

an eight-hour day's work and found that the maximum carbon-monoxide-hemoglobin content was 30 per cent, a condition associated with mild subjective symptoms. It would be interesting to make a further study into the physiological effects experienced by traffic officers at congested intersections, and, in case the findings warranted action, the time of duty at points of continual congestion might be diminished in order to minimize the hazard.

Applying the same standards to repair shops it is apparent that a real hazard exists in such establishments, as revealed by the results of 102 samples obtained in our study. Only 41 per cent of these samples showed a carbon-monoxide content less than 1 part in 10,000. Workers of the United States Buréau of Mines (13) recently reported carbon-monoxide tests made with a recording instrument in two garages. This carbon-monoxide recorder showed that the average concentration in any one day in one garage never exceeded 1 part per 10,000 and the maximum average in another garage for one day reached 1.6 parts per 10,000. However, at times the carbon-monoxide content in these garages exceeded 8.9 parts per 10,000, and the maximum average for any one hour was found to be 4.3 parts per 10,000. Had these tests been made during cold weather, no doubt the carbon monoxide would have reached higher concentrations. Similar conditions were found by the workers of the Bureau of Industrial Hygiene of New York in some of their tests in garages and repair shops (2), (12). Although the average conditions found by these workers did not show as high an amount of carbon monoxide in the atmosphere of the repair shops visited by them as that obtained in the present investigation, yet as a result of their research the investigators of the New York Bureau of Industrial Hygiene concluded that the only safe method is ventilation, and that the carbon monoxide should not exceed 0.5 part in 10,000 volumes of air. In connection with regulations governing ventilation of public garages the municipal code (section 2196) of the city of Chicago requires that the carbon-monoxide content should not exceed 2 parts per 10,000 parts of air.

The average of 102 determinations of the carbon monoxide in the atmosphere of 27 repair shops investigated in the present survey showed 2.1 parts of this gas in 10,000 volumes of air. The possibility of such an amount of carbon monoxide being inhaled by an active worker over a period of eight hours reveals a serious condition in automobile repair shops. Our experience has been that even with a well-designed system of ventilation in use the atmosphere of a repair shop will show as much as 0.6 part of carbon monoxide in 10,000 parts of air. It is our belief that no automobile motor should be permitted to run longer than 30 seconds in any inclosed garage except when being driven in or out of the garage. Testing of car-

buretors and any other operation of an engine indoors should be done only when some means has been taken to remove the exhaust gas directly to the outer atmosphere, possibly by means of a flexible hose connection to the exhaust pipe, as described earlier in this paper.

Summary

This survey was undertaken to ascertain whether or not a health hazard from carbon monoxide existed in the streets of our large cities, inside of autobusses, and in repair shops. Fourteen of the largest cities in the country were visited, having a combined population of over 19,000,000, and 250 samples of air were obtained for carbon-monoxide analysis. These samples were analyzed by the iodine-pentoxide method, using a liquid-air cooling tube which was shown to be necessary in order to eliminate gasoline vapor, a substance which tends to vitiate the results of the analysis. Our street samples were taken in such a manner as to approach the most congested conditions that may exist at a busy traffic intersection. Hence, it is felt that these results indicate the maximum hazard from automobile exhaust gas that may exist to-day in our metropolitan thoroughfares. The average of 141 tests made in city streets at peak hours of traffic showed a contamination of 0.8 part of carbon monoxide per 10,000 parts of air. Only 24 per cent of all the street samples had more than 1 part of carbon monoxide in 10,000 of air, and in only one location, a covered passageway, was there as much as 2 parts per 10,000. Samples taken inside of autobusses yielded even lower concentrations of carbon-monoxide gas. The figures for street air, when viewed in the light of present day standards of exposure to carbon monoxide, do not reveal the existence of a health hazard from this source in our city streets. The only individual who may possibly be exposed to a health hazard from inhaling street air containing automobile exhaust gas is the traffic officer. This potential hazard may be minimized by diminishing the duration of exposure at the most congested traffic stations.

Of the 102 tests made in 27 garages in the 14 cities visited, the average carbon-monoxide content was found to be 2.1 parts in 10,000. More than half of the samples (59 per cent) contained over 1 part of carbon monoxide, and 18 per cent of all the samples contained over 4 parts of this gas in 10,000 parts of air. These results for repair shops show a dangerous condition that demands the serious consideration of those concerned. This hazard in repair shops may be reduced to a minimum by not allowing the motors of automobiles to run longer than 30 seconds unless the car is in necessary motion or the exhaust is connected to the outside air by a direct air-tight outlet

of ample caliber. Without such outlet no automobile engine should be allowed to run indoors, except to reach its berth or to leave by the shortest route. All of these samples were taken in garages of considerable size. The great danger to life is unquestionably in the small private garage containing one or two cars. Under any circumstances the discharge of an automobile exhaust into a roofed inclosure should be regarded as a hazardous act.

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COURT DECISIONS RELATING TO PUBLIC HEALTH

Nuisance from overflow of town septic tank enjoined.—(Oklahoma Supreme Court; Town of Jennings *v.* Pappenfuss, 263 P. 456; decided January 24, 1928.) An action was brought to enjoin a town from maintaining a nuisance and to compel it to abate the same. The plaintiff alleged that the overflow upon her land from a septic tank of the town sewer constituted a nuisance, the odor and stench being of such extent that it was practically impossible to live upon her farm. The trial court found that the town had been maintaining a nuisance by permitting the overflow from the septic tank to flow into a ditch and over and upon the plaintiff's land, and adjudged that a permanent injunction be granted the plaintiff, enjoining the defendant from maintaining the nuisance, and that defendant proceed at once to abate the nuisance. On appeal the judgment of the lower court was affirmed by the supreme court.

Revocation of license for manufacture and bottling of soft drinks upheld.—(Maine Supreme Judicial Court; Appeal of Bornstein, 140 A. 194; decided January 26, 1928.) Chapter 155, Laws of 1925, provided for the licensing, by the commissioner of agriculture, of any person, firm, or corporation manufacturing or bottling for sale at wholesale any drink product or other nonalcoholic beverage within the State, and also empowered the commissioner to revoke or suspend any license whenever any provisions of the act had been violated. The act also provided that "Whenever artificial colors or flavors are used in the manufacture of drink products or other nonalcoholic beverages, the bottle or other container shall be distinctly labeled or crowned 'Artificially colored and flavored.'" The appellant had been licensed under the act and, after notice and hearing, the commissioner revoked such license on the ground that the appellant had bottled a beverage, containing artificial color, in bottles or containers not labeled or crowned "Artificially colored and flavored." On appeal before the supreme court it was urged that there was a violation of the appellant's constitutional guaranties in that he was deprived of a property right without due process of law, but the court in upholding the revocation said:

> The constitutional questions argued are not open to the appellant in this proceeding. The single issue here is revocation of the license granted by the commissioner. In accepting the license and acting under it, the appellant consented to all conditions imposed thereby. He took it subject to such conditions as the legislature had seen fit to impose. Such license is in no sense a contract or property, immunity, or privilege. State *v.* Cote, 122 Me. 450, 120 A. 538; Burgess *v.* Brockton, 235 Mass., 95, 126 N. E. 456; Com. *v.* Kinsley, 133 Mass. 578; 17 R. C. L. 554. The requirements of the act as to labeling or crowning bottles and containers must be read into the license as a condition to which the appellant consented. State *v.* Cote, supra. If the validity of the act in its branding requirements is to be tested, it must be in another and different proceeding.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Garbage Disposal at Highlands, N. J. Anon. *The American City*, vol. 38, No. 1, January, 1928, pp. 147–148. (Abstract by C. R. Cox.)

The population of Highlands varies from 2,000 in winter to about 10,000 in summer. A United States standard incinerator was installed in June, 1927, with a guaranteed capacity per 24 hours of 24 tons of refuse consisting of 65 per cent garbage, with moisture content less than 70 per cent, and 35 per cent rubbish without added fuel. Tests indicated the capacity to be 72 tons per 24 hours and that the temperature in the combustion chamber was 2,000° F. Three charging openings are used, one for rubbish onto the firing hearth, one for wet garbage onto the drying grates, and one for the carcasses of animals, which are placed in the bottom of the combustion chamber. Collections from August 1 to September 10 amounted to 503 tons of refuse, which was incinerated at the following costs: Labor, $318.35; wood, $30; coal, $42; electric power, $14, or a total of $404.35, or $0.803 per ton. The cost of collection was as follows: Labor, $891, and gas and oil, $86.40, or an average of $1.90 per ton. About $270 was saved during the 36-day period over former cost of disposal on a sanitary dump where lime and earth cover was used to prevent odors.

A New Diluent for Paris Green. P. A. Dalal and E. E. Madon. *Indian Medical Gazette*, vol. 62, No. 10, October, 1927, pp. 554–555. (Abstract by W. A. Hardenberg.)

One of the problems in anopheline control in Bombay has been "sprinkler tanks," which are elevated tanks provided for automatic gravity fire service. These tanks mostly contain clean water, are generally 30 to 60 feet in width and length and 6 feet deep, and even when covered are not mosquito-proof. There are also other cisterns, usually containing clean water, which are used for a variety of purposes. Pyrethrum-base powders were not effective. No satisfactory diluent for Paris green was available. Cork powder is effective but too expensive; sawdust sinks after a short time; fine road dust sinks too quickly and does not withstand agitation or wind action; flue dust from boiler flues was quite satisfactory; but French chalk, which is finely powdered magnesium silicate, proved best. This is readily obtainable in India in smooth hard pieces, which can be ground in a mortar. To treat a tank 32 by 16 by 6 feet deep, 40 grains of Paris green and 8 ounces of French chalk were used. Though a strong wind was blowing, a satisfactory film was maintained and the treatment proved effective. This mixture is considered ideal for use on small cisterns.

Malaria and Malaria Control in Turkey (Malaria und Malariabekampfung in der Tuerkei). E. Martini. Leaflet of 2 pages, Hamburg, Germany. (Abstract by A. L. Dopmeyer.)

Malaria is a disease of very great importance in Turkey. Although there is very little malaria in Constantinople, there is a great deal of it in the district of Anatolia. All sections, however, are said to suffer heavily from the disease, and in the warm lowlands of the west and south the severe forms of the disease are found.

The climate of the country is variable. The elevated plateaus are dry, cold in winter and very warm in summer. The northern part has a damp, cold climate and the south has extremely warm summers and mild winters. In contrast to the usual three species of *Anopheles* mosquitoes found in Europe north of the Alps, there are eight distinct species here. In the mountainous sections the *Anopheles superpictus* is abundant, and in other sections where water is plentiful, the streams serve as breeding places for *Anopheles elutus* and *maculipennis*.

In 1925 the new government took an active interest in malaria control and formed so-called malaria missions consisting of a chief medical officer and subordi-

nate medical and other personnel. Malaria stations were established for the treatment of cases in order to check the spread of infection. The first mission was started in Angora and later ones were established at other points; and it is significant to note that, according to statistics compiled, the malaria reduction depends in large degree on the length of time the mission has been operating.

The success of the work at Angora is evidenced by the fact that a few years ago it was thought that it might be necessary to move the capital from that city on account of malaria, whereas the disease in that city to-day is practically non-existent.

The total cost of malaria control work in Angora for 1926, with a population of 30,000, was $35,700 or $1.19 per capita.

Report of an Investigation of a Malaria Epidemic in Solo, 1926. S. L. Brug and Dr. E. W. Walch. *Mededeelingen Dienst d. Volksgezondheid in Nederlandsch-Indie,* Foreign Edition, 1927. Part 3, pp. 531–579. (Abstract by H. R. Crohurst.)

This article contains a description of conditions in Solo, the third largest town of the Netherland Indies, during the malarial epidemic of 1926. There are presented data covering the hydrographic conditions of the town, history of malaria at Solo, area involved, and the center of the 1926 epidemic, progress of the epidemic, the examination of *Anopheles,* the distribution of quinine, the probable cause of the epidemic, and future control measures.

On the evidence of indirect data it was supposed that the vectors of the epidemic came chiefly from the bed of a storm-water canal, which in the dry season shows numerous isolated pools. Owing to the rains setting in so late in 1925 this canal had not been flushed during an abnormally long time. With this opinion corresponded the fact that the heaviest affected native villages lay precisely where the bed of the canal showed the greatest number of pools.

The direct proof regarding the storm-water canal could not be given, as it was only once dry during a sufficient number of days during the investigation to be examined for the presence of larvæ. At that time it contained almost exclusively larvæ of *M. vaga,* which does not exclude the fact that before this time other species may have bred there.

Only one *Anopheles* was found infected, namely, an *M. rossi.* The larvæ of this species were found only in the northern part of the town, but there, in small numbers, and in breeding places of a very different nature. Other potential carriers found during the investigation were somewhat larger numbers of *M. aconita* and *N. fuliginosus.*

The Government distributed without charge, during the epidemic, 420,000 tabloids of 0.2 gram of bisulphate of quinine. Prophylaxis was applied especially in the schools.

It is recommended that the condition of the storm-water canal be observed in the future, as it is believed that the river Pepe carries too little water in the dry season to effect a proper flushing of the canal precisely at the time that it is most necessary.

Report of Some Experiments on the Efficiency as Insecticides of "Flit," "Rids," and Some Other Preparations Made at the Medical Laboratory at Weltevreden. S. L. Brug and Dr. J. Van Slooten. *Mededeelingen Dienst d. Volksgezondheid in Nederlandsch-Indie,* Foreign Edition, 1927. Part 3, pp. 524–530. (Abstract by H. R. Crohurst.)

The authors describe the effects on mosquitoes, flies, cockroaches, and bedbugs, by spraying with various insecticides, "flit," commercial "rids," and "rids" prepared in the laboratory with kerosene, carbon tetrachloride, methyl salicylate, and various mixtures of each.

The authors conclude: "Flit kills such insects as flies and mosquitoes very readily. With commercial 'Rids,' and with 'Rids' prepared in the medical

laboratory nearly the same results were obtained. Pure kerosene is certainly considered somewhat inferior to these. There is no objection to omitting the methyl salicylate from the 'Rids' formula, the addition of a quantity of carbon tetrachloride of 2 parts to 100 parts of kerosene being sufficient to guarantee a good effect. One gets thereby a simpler and cheaper preparation with the same effects. On account of its irritating effects on the skin, conjuctiva, and nasal mucosa, and on account of producing stains, 'Flit' is less recommendable. Unless one can spray the insects repeatedly, the effect on cockroaches is doubtful. Since the penetrating power of an insecticide fluid applied by means of a spray is not sufficient to reach bedbugs in all their hiding places, all these preparations are of little importance in the destruction of such vermin."

Italy's Campaign Against Malaria. Arturo Castiglioni. *British Medical Journal*, No. 3475, August 13, 1927, pp. 278–289. (Abstract by R. E. Tarbett.)

From ancient times malaria has been a grave problem in the area now comprising the Kingdom of Italy. Archaeologists have shown that the Etruscans attempted to drain the swamps and marsh land and later the Romans actually eradicated these areas in the Campagna Romana. After the fall of the Roman Empire this area again became malarious.

Grassi, Celli, Marchiafara, and Bignami collaborated with Ross in the study of the malaria parasite and mode of transmission of malaria. They also inaugurated the legislation on the supply of quinine to the malarious regions. Quinine is prepared by the State laboratories and sold to certain public retailers. All profits are placed in a special fund for carrying on malaria control work. Malaria is classified as an occupational disease and carries the right to indemnity.

The usual methods employed in malaria control are carried on. The author places considerable stress on the raising of cattle in the malarious regions and the development of nonhuman-stinging *Anopheles*.

From 1887–1902 there was an average of 15,000 deaths per annum; 1903–5, 8,000 deaths per annum; and a decline to 2,000 in 1914. An increase reaching 11,487 in 1918 occurred during the war period. Since that time a rapid decrease has occurred, the deaths in 1923 being 3,000.

The Water Supply Project of the Mahoning Valley Sanitary District. W. H. Dittoe. *Journal American Water Works Association*, vol. 18, No. 6, December, 1927, pp. 655–663. (Abstract by M. F. Trice.)

"The purpose of this paper is to explain briefly the conditions leading to the establishment of the sanitary district, the provisions of the sanitary district act controlling the procedures followed, and the general features of the recommended plan." The Mahoning River, draining an area of approximately 1,000 square miles, is grossly polluted by sewage and industrial wastes, and yet serves as a source of public water supply for Warren, Niles, and Youngstown, the three principal cities of the valley, each of which operates a filtration plant. In spite of resourceful control these plants deliver to consumers a highly unsatisfactory water. Upon action by the city councils of Niles and Youngstown, and application to the court of common pleas of Mahoning County, which, after due hearing of the court on February 2, 1926, "ordered the formation of a district for the purpose of providing a satisfactory public water supply for the two municipalities."

Provisions of law.—The sanitary district act of Ohio permits two or more political subdivisions to organize for the following purposes: (*a*) Improved water supply, and (*b*) improved sewage disposal. This district was organized solely for improving the water supply, and therefore sewage disposal is not discussed. The court appoints a board of directors which supervises the work. The Ohio law requires the board to prepare plans for the improvements. The board allows hear-

ings relative to the plans, estimates costs, assesses the political units benefited proportionately, issues bonds for the execution of the plan, is empowered to proceed with construction either directly or by contract, and after completion of the project supervises maintenance and operation.

The plan for the district water supply.—The essential features of the plan include (1) the Meander Creek Reservoir, formed by the construction of the Mineral Ridge Dam; (2) purification and pumping works located immediately below dam; (3) pipe lines for delivery of the purified supply to the two cities; (4) a covered distributing reservoir in Youngstown and a steel standpipe in Niles, for reserve storage of water on the distributing systems.

The cost of execution of this plan is estimated at $9,150,000, made up of the following principal elements:

Dam and reservoir	$3, 781, 960
Purification and pumping works	2, 310, 030
Pipe lines and distributing reservoir for Youngstown	2, 661, 600
Pipe lines and standpipe for Niles	396, 410

The principal features of the above elements are discussed broadly, as, for instance, the dimensions and size of the dam, capacity and yield of the reservoir and the opportunity for future increase of the supply, the highway changes and resulting bridge construction involved, the design and provisions of the purification plant (number of units, their dimensions and capacity), pumping equipment (steam-turbine-driven), delivery mains from purification plant to above cities, and the improvements to be made at these municipalities. Advantages of district procedure are also discussed.

Recent Advances in Controlling Chloro-Tastes and Algæ Development. L. H. Enslow. *Journal American Water Works Association*, vol. 18, No. 5, November, 1927, pp. 621–640. (Abstract by C. R. Cox.)

. This paper reviews the experiences of various plants on this continent where taste problems, due to the chlorination of water, existed. Superchlorination at one plant in Dallas, Tex., followed by subsequent chlorination of the filtered effluent, was effective in destroying tastes due to vegetable matter and algæ in the raw lake water when the dose was sufficient to produce a residual of 0.3 p. p. m. or more. Experience at the Turtle Creek plant at Dallas, where iron sulphate and lime are employed to coagulate and soften the supply, indicated that the filtered water delivered to the consumer had a noticeable chlorine taste, although that in the open clear-water basin did not. It was found that these tastes were due to formation of stable hypochlorites by the reaction of chlorine and the alkaline salts in the water. This action was prevented by lowering the pH value of the filtered water prior to chlorination. The destruction of chloro-phenol tastes by the practice of superchlorination and dechlorination at Toronto, Canada, is reviewed. Importance of having sufficient reaction time between the application of the chlorine dose and the addition of the dechlorinating agent was emphasized. The prevention of formation of chloro-phenol tastes by the addition of ammonia before chlorine is then reviewed and special mention is made of satisfactory results secured at Greeneville, Tenn. where 0.25 p. p. m. ammonia were added to the raw water previous to the addition of chlorine to the water passing through the mixing basin. The cost of this treatment was about 60 cents per million gallons of water treatment. Ammonia solutions are made by the addition of 6.25 pounds of ammonia gas to 100 gallons of water, which solution was fed through an ordinary orifice box. It is significant to note that ammonia prevents the formation of chloro-phenol tastes, but does not destroy such tastes once they are formed, so that the ammonia has to be added prior to the chlorine. The suppression of algal growth in outdoor swimming pools and coagulation basins in the South by the use of chlorine is

briefly reviewed. The discussion of this paper reviewed the method of treating phenolic waste at a coke plant in Troy, N. Y., and in the destruction of chlorophenol tastes at a filtration plant in Rochester, N. Y., by the use of permanganate of potash. The doses of permanganate varied from 1.0 to 1.6 pounds per million gallons of water treated. It was also pointed out in the discussion that organic growths on sand grains can be effectively prevented by moderate doses of chlorine applied to the raw water or to the wash water. The advantages of prechlorination in the treatment of grossly polluted waters were emphasized.

Small Iron Removal Plant for Red Bank Water Works. Wellington Donaldson. *Engineering News-Record*, vol. 100, No. 3, January 19, 1928, pp. 112-114. (Abstract by W. M. Olson.)

This article gives the history, design considerations, and operating data concerning the new 1.5 m. g. d. plant for treating the ground water supply of Red Bank, N. J. Three photographs and an excellent cross section make clear the essential features of the plant designed to eliminate objectionable staining properties of the raw water. Raw water is pumped to a simple cascade-type aerator, flows downward through three pressure filters, and thence up to the wash-water tank, from which it spills over a weir into the distributing reservoir. Standard horizontal pressure filters were adopted in order to have the plant operate as nearly automatically as possible. Results of tests are included to show the superiority of sand to coarse contact filters.

Excessive algal growths developing in the reservoir after the installation of the new plant were combated successfully by chlorinating the effluent. The operation of the plant requires the attention of one man for less than an hour each day. The treatment works, costing $52,881, are a good example of careful design to fit local conditions.

DEATHS DURING WEEK ENDED MARCH 17, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended March 17, 1928, and corresponding week of 1927. (From the Weekly Health Index, March 21, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Mar. 17, 1928	Corresponding week, 1927
Policies in force	70, 602, 861	67, 030, 693
Number of death claims	14, 679	13, 711
Death claims per 1,000 policies in force, annual rate	10. 9	10. 7

Deaths from all causes in certain large cities of the United States during the week ended March 17, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, March 21, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Mar. 17, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 17, 1928 [2]
	Total deaths	Death rate [1]		Week ended Mar 17, 1928	Corresponding week 1927	
Total (66 cities)	8, 482	14. 9	14. 1	881	935	[3] 74
Akron	67			13	4	141
Albany [4]	42	18. 2	18. 3	6	5	123
Atlanta	83	17. 1	20. 9	7	12	
White	45		15. 8	2	6	
Colored	38	([5])	33. 2	5	6	

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended March 17, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927—Continued

City	Week ended Mar. 17, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 17, 1928 [3]
	Total deaths	Death rate [1]		Week ended Mar. 17, 1928	Corresponding week 1927	
Baltimore [4]	276	17.4	19.2	37	31	117
White	209		16.4	26	21	104
Colored	67	(5)	35.5	11	10	172
Birmingham	62	14.6	17.5	8	9	66
White	21		8.2	5	3	69
Colored	41	(5)	32.0	3	6	63
Boston	271	17.7	17.2	29	33	80
Bridgeport	46			5	2	93
Buffalo	159	15.0	17.9	24	28	103
Cambridge	35	14.5	14.3	2	3	36
Camden	42	16.2	17.2	6	4	125
Canton	19	8.5	14.7	2	11	48
Chicago [4]	880	14.6	12.3	66	75	57
Cincinnati	158	20.9	17.0	13	10	79
Cleveland	211	10.9	10.2	23	23	62
Columbus	68	12.0	12.9	3	5	28
Dallas	56	13.5	9.9	5	1	
White	42		8.2	3	1	
Colored	14	(5)	20.9	2	0	
Dayton	34	9.6	13.6	3	3	50
Denver	83	14.8	15.5	6	6	
Des Moines	33	11.4	12.6	0	2	0
Detroit	355	13.5	13.1	62	58	96
Duluth	25	11.2	11.8	1	3	23
El Paso	54	24.0	15.2	11	4	
Erie	31			4	4	82
Fall River [4]	20	7.8	15.7	3	6	51
Flint	28	9.8	12.1	8	7	102
Fort Worth	40	12.4	12.7	2	2	
White	36		11.9	1	2	
Colored	4	(5)	18.6	1	0	
Grand Rapids	33	10.5	6.4	0	1	0
Houston	63			3	5	
White	49			2	5	
Colored	14	(5)		1	0	
Indianapolis	112	15.3	14.2	8	7	61
White	93		13.9	8	6	70
Colored	19	(5)	16.3	0	1	0
Jersey City	91	14.7	13.1	12	7	90
Kansas City, Kans	31	13.7	15.1	5	5	106
White	22		11.9	4	4	99
Colored	9	(5)	29.5	1	1	145
Knoxville	32	15.9	8.7	3	3	65
White	23		6.4	2	3	48
Colored	9	(5)	26.6	1	0	213
Los Angeles	269			21	18	60
Lowell	23	10.9	12.3	3	4	63
Lynn	20	9.9	12.9	5	1	126
Memphis	62	17.0	25.6	6	6	70
White	32		21.2	2	3	37
Colored	30	(5)	33.7	4	3	125
Milwaukee	121	11.6	12.2	11	13	49
Minneapolis	101	11.6	10.4	5	7	30
Nashville	53	20.0	10.6	9	2	142
White	37		7.9	6	1	128
Colored	16	(5)	17.4	3	1	180
New Bedford	30	13.1	12.2	2	1	43
New Haven	61	17.0	10.2	3	5	42
New Orleans	168	20.5	23.1	11	16	53
White	102		19.9	7	11	51
Colored	66	(5)	32.1	4	5	56
New York	1,723	15.0	14.2	200	258	83
Bronx Borough	189	10.4	10.5	18	23	54
Brooklyn Borough	594	13.5	12.3	78	104	73
Manhattan Borough	731	21.8	19.7	92	107	109
Queens Borough	150	9.2	10.6	15	16	60
Richmond Borough	59	20.5	18.1	3	8	54
Newark, N. J	140	16.1	12.0	17	13	88
Oakland	60	11.4	10.9	6	4	66
Oklahoma City	26			3	8	

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended March 17, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927—Continued

City	Week ended Mar. 17, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 17, 1928 [2]
	Total deaths	Death rate [1]		Week ended Mar. 17, 1928	Corresponding week 1927	
Omaha	61	14.3	12.1	1	4	12
Paterson	45	16.2	15.6	4	6	69
Philadelphia	627	15.9	16.9	73	58	96
Pittsburgh	188	14.6	14.4	21	23	69
Portland, Oreg	67			3	2	32
Providence	82	15.0	13.0	6	9	52
Richmond	62	16.7	16.6	7	8	91
White	35		16.1	4	3	81
Colored	27	(5)	17.8	3	5	110
Rochester	94	15.0	12.9	5	6	41
St. Louis	308	19.0	14.4	20	16	67
St. Paul	69	14.3	13.8	2	7	19
Salt Lake City [4]	32	12.1	16.9	3	5	49
San Antonio	107	25.7	13.8	20	7	
San Diego	46	20.1	14.9	3	2	57
San Francisco	137	12.2	12.0	10	9	63
Schenectady	18	10.1	13.4	2	0	63
Seattle	96	13.1	11.0	5	5	51
Somerville	33	16.8	12.8	5	3	173
Spokane	44	21.1	8.6	4	3	103
Springfield, Mass	35	12.2	12.0	4	5	63
Syracuse	50	13.1	9.5	6	2	73
Toledo	85	14.2	13.0	9	14	86
Trenton	38	14.3	12.6	3	4	51
Washington, D. C	174	16.5	16.1	13	15	74
White	110		13.4	4	10	33
Colored	64	(5)	24.1	9	5	166
Waterbury	19			1	5	29
Wilmington, Del	35	14.2	11.6	2	8	53
Worcester	57	15.1	14.1	3	4	36
Yonkers	27	11.6	12.7	[illegible]	3	68
Youngstown	31	9.3	11.7	6	10	80

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 66 cities.
[4] Deaths for week ended Friday, Mar. 16, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15, Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended March 26, 1927, and March 24, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 26, 1927, and March 24, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928
New England States:								
Maine		5	34	7	131	33	0	0
New Hampshire		2				16		0
Vermont	1				17	96	0	0
Massachusetts	89	86	11	11	241	1,809	2	2
Rhode Island	11	7				91	0	0
Connecticut	20	23	21	7	115	301	0	1
Middle Atlantic States:								
New York	387	390	[1] 94	[1] 57	767	2,548	7	33
New Jersey	100	149	20	41	68	1,307	1	3
Pennsylvania	181	197			691	1,345	1	4
East North Central States:								
Ohio		68		22		1,871		5
Indiana	25	25	39	65	282	280	0	0
Illinois	114	192	31	251	2,399	232	6	17
Michigan	114	51			305	1,536	0	3
Wisconsin	38	23	123	78	735	106	6	6
West North Central States:								
Minnesota	25	27	1	5	285	82	8	2
Iowa [2]	22	11			602	36	2	2
Missouri	50	52	21	169	201	339	2	9
North Dakota	8	3			189		0	3
South Dakota	4		7		216		0	
Nebraska	4	6	3	90	323	69	0	0
Kansas	9	8	2	50	1,114	87	0	1
South Atlantic States:								
Delaware		1			22	21	1	0
Maryland [2]	40	22	151	50	46	1,163	0	0
District of Columbia	25	21	5	11	9	182	1	1
Virginia								
West Virginia	10	23	81	50	197	120	0	2
North Carolina	29	111			564	3,290	0	0
South Carolina	19	21	1,893	859	76	950	0	0
Georgia	21	12	504	154	86	105	0	0
Florida	41	10	13	1	157	70	1	0
East South Central States:								
Kentucky				16		240		0
Tennessee	11	3	190	211	131	281	4	0
Alabama	25	31	170	254	238	586	1	8
Mississippi	6	15						1

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 26, 1927, and March 24, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928
West South Central States:								
Arkansas	3	2	102	377	104	506	0	3
Louisiana	27	11	11	157	140	374	1	1
Oklahoma [1]	16	17	134	489	179	287	2	3
Texas	53	42	25	52	211	491	0	6
Mountain States:								
Montana	2	2	1		53	1	4	5
Idaho	3				29		0	1
Wyoming					50	45	0	2
Colorado	5	26	1	4	349	25	0	14
New Mexico	23	6		9	76	142	1	0
Arizona		8	6		31	27	0	5
Utah [2]	4	4	8	7	172	11	0	7
Pacific States:								
Washington	25	7	12		392	278	4	2
Oregon	16	8	97	49	180	125	1	7
California	128	102	74	32	3,490	234	4	4

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928
New England States:								
Maine	0	0	53	26	0	0	2	0
New Hampshire		0		9		0		0
Vermont	0	0	8	17	0	0	0	0
Massachusetts	0	1	540	317	0	0	14	2
Rhode Island	0	0	20	46	0	0	0	0
Connecticut	0	0	136	55	0	0	1	1
Middle Atlantic States:								
New York	0	9	1,215	943	13	5	22	16
New Jersey	0	1	401	317	0	1	3	6
Pennsylvania	1	3	589	603	0	0	15	12
East North Central States:								
Ohio		2		232		57		4
Indiana	0	0	226	150	152	238	0	1
Illinois	2	2	381	345	51	88	10	13
Michigan	0	1	367	277	44	36	6	4
Wisconsin	1	2	188	209	7	12	2	1
West North Central States:								
Minnesota	0	0	256	145	1	0	4	3
Iowa [2]	0	0	49	79	30	33	20	0
Missouri	0	2	148	105	247	71	1	1
North Dakota	1	0	44	79	1	0	0	2
South Dakota	0		73		21		0	
Nebraska	0	0	72	100	32	53	0	0
Kansas	1	1	149	196	32	84	1	0
South Atlantic States:								
Delaware	0	0	31	3	0	0	0	0
Maryland [2]	0	0	66	72	0	0	7	5
District of Columbia	0	1	26	44	0	2	1	1
Virginia					1			
West Virginia	0	1		54	25	67	10	3
North Carolina	0	0	27	23	88	121	4	3
South Carolina	0	0	2	4	16	7	7	2
Georgia	0	0	13	27	111	0	8	3
Florida	0	0	8	6	53	2	10	7
East South Central States:								
Kentucky		3		34		19		3
Tennessee	1	0	21	17	16	20	15	5
Alabama	1	1	13	19	51	10	23	13
Mississippi	0	0	7	16	5	3	5	3

[1] Exclusive of Tulsa.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 26, 1927, and March 24, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928	Week ended Mar. 26, 1927	Week ended Mar. 24, 1928
West South Central States:								
Arkansas	0	0	22	26	9	11	5	4
Louisiana	0	0	5	15	5	34	11	4
Oklahoma [1]	0	1	62	66	38	245	14	3
Texas	0	0	26	144	29	46	22	4
Mountain States:								
Montana	0	0	54	6	7	16	0	0
Idaho	0	0	14	10	8	1	0	0
Wyoming	0	0	19	14	8	8	0	0
Colorado	0	0	103	81	6	2	0	0
New Mexico	0	0	14	31	1	1	0	1
Arizona	0	0	9	5	0	20	1	0
Utah [2]	0	0	36	6	8	14	0	0
Pacific States:								
Washington	0	0	92	37	64	49	2	2
Oregon	0	1	43	17	0	77	1	1
California	2	2	231	188	15	29	6	5

[2] Week ended Friday. [1] Exclusive of Tulsa.

Report for Week Ended March 17, 1928

DISTRICT OF COLUMBIA

	Cases
Diphtheria	25
Measles	198
Scarlet fever	45
Smallpox	0

Report for Week Ended March 10, 1928

MONTANA

	Cases
Diphtheria	14
Measles	2
Meningococcus meningitis	5
Scarlet fever	40
Smallpox	23

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January, 1928										
Hawaii Territory	6	63	15		7		0	2	0	4
February, 1928										
Indiana	2	141	143		533		0	577	471	11
Iowa	10	66	16		198		0	416	295	9
Louisiana	1	86	345	100	874	10	3	44	90	48
Maryland	2	164	203		2,921	1	1	293	1	15
Minnesota	13	123	10		42		1	708	82	9
New Jersey	7	595	90		2,415		1	1,197	1	13
Ohio	16	587	119		3,715		10	1,512	122	30
Wyoming	9	7			173			100	16	1

January, 1928	Cases
Hawaii Territory:	
Chicken pox	29
Conjunctivitis	252
Hookworm disease	1
Leprosy	4
Mumps	48
Tetanus	3
Trachoma	47
Whooping cough	34

February, 1928	Cases
Actinomycosis:	
Minnesota	1
Anthrax:	
New Jersey	3
Chicken pox:	
Indiana	273
Iowa	310
Louisiana	38
Maryland	565
Minnesota	416
New Jersey	896
Ohio	1,500
Wyoming	26
Dysentery:	
Minnesota	4
German measles:	
Iowa	8
Maryland	15
New Jersey	173
Ohio	50
Wyoming	3
Hookworm disease:	
Louisiana	20
Impetigo contagiosa:	
Iowa	6
Maryland	5
Lead poisoning:	
New Jersey	2
Ohio	19
Leprosy:	
Louisiana	4
Lethargic encephalitis:	
Louisiana	2
Maryland	6
Minnesota	1
Ohio	4
Malta fever:	
Minnesota	1
Mumps:	
Indiana	215
Iowa	218
Louisiana	19
Maryland	133
Ohio	1,843
Wyoming	17
Ophthalmia neonatorum:	
New Jersey	6
Ohio	102
Puerperal fever:	
Ohio	1
Rabies in animals:	
Maryland	3
Scabies:	
Iowa	23
Maryland	2
Septic sore throat:	
Indiana	2
Iowa	1
Louisiana	3
Maryland	12
Ohio	82
Tetanus:	
Louisiana	2
Maryland	4
Trachoma:	
Louisiana	1
Maryland	1
Minnesota	1
New Jersey	2
Ohio	4
Trench mouth:	
Maryland	1
Trichinosis:	
New Jersey	14
Tularaemia:	
Louisiana	1
Maryland	3
Vincent's angina:	
Maryland	13
Whooping cough:	
Indiana	82
Iowa	40
Louisiana	30
Maryland	192
Minnesota	101
New Jersey	631
Ohio	726
Wyoming	37

RECIPROCAL NOTIFICATIONS

Notifications regarding communicable diseases sent during the month of February, 1928, by departments of health of certain States to other State health departments

Referred by—	Actinomycosis	Chicken pox	Diphtheria	Amebic dysentery	Malta fever	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
California					1			2	1	
Connecticut			1			1				
Illinois							1		2	
Minnesota	1	1		3				61	1	
New York						2				2

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 97 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of nearly 31,196,000. The estimated population of the 92 cities reporting deaths is more than 30,580,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended March 10, 1928, and March 12, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
42 States	1,707	1,719	
97 cities	1,034	1,083	923
Measles:			
41 States	17,401	15,788	
97 cities	6,754	5,540	
Poliomyelitis:			
42 States	31	12	
Scarlet fever:			
42 States	5,102	6,277	
97 cities	1,800	2,644	1,158
Smallpox:			
42 States	1,241	945	
97 cities	135	174	134
Typhoid fever:			
42 States	122	227	
97 cities	22	45	39
Deaths reported			
Influenza and pneumonia:			
92 cities	1,249	1,252	
Smallpox:			
92 cities	0	0	

City reports for week ended March 10, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	13	2	1	1	0	0	12	2
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	0
Manchester	84,000	0	2	0	0	1	9	0	4

[1] Estimated July 1, 1925.

City reports for week ended March 10, 1928—Continued

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND—continued									
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Burlington	[1] 24,089	0	0	0	0	0	0	0	1
Massachusetts:									
Boston	787,000	55	47	31	1	3	455	11	38
Fall River	131,000	4	4	4	0	2	2	0	3
Springfield	145,000	9	3	3	0	0	2	48	1
Worcester	193,000	28	4	1	0	0	14	116	3
Rhode Island:									
Pawtucket	71,000	5	1	0	0	0	6	20	1
Providence	275,000	3	8	9	0	2	49	6	9
Connecticut:									
Bridgeport	(2)	5	7	11	1	1	0	0	10
Hartford	164,000	10	8	3	2	1	5	7	10
New Haven	182,000	6	2	0	0	0	188	128	12
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	10	11	16	--------	1	398	30	19
New York	5,924,000	212	215	277	49	29	741	43	260
Rochester	321,000	11	10	8	--------	1	12	21	6
Syracuse	185,000	41	4	3	--------	0	80	10	9
New Jersey:									
Camden	131,000	3	6	4	1	1	8	6	4
Newark	459,000	36	13	20	10	0	321	20	24
Trenton	134,000	1	3	4	0	0	3	1	4
Pennsylvania:									
Philadelphia	2,008,000	0	74	70	--------	13	226	0	89
Pittsburgh	637,000	21	20	33	--------	3	212	131	36
Reading	114,000	7	3	4	--------	1	2	2	2
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	18	8	22	0	0	262	2	14
Cleveland	960,000	60	27	65	26	6	34	247	32
Columbus	285,000	8	4	1	0	0	13	7	1
Toledo	295,000	53	6	6	0	0	368	22	4
Indiana:									
Fort Wayne	99,900	1	2	1	0	0	0	0	1
Indianapolis	367,000	30	8	4	0	2	53	132	9
South Bend	81,700	1	1	0	0	0	0	0	1
Terre Haute	71,900	1	1	0	0	1	0	0	2
Illinois:									
Chicago	3,048,000	122	79	103	20	8	36	60	110
Springfield	64,700	11	0	0	2	2	0	11	1
Michigan:									
Detroit	1,290,000	65	59	45	7	3	880	70	46
Flint	136,000	17	4	2	0	0	23	244	8
Grand Rapids	156,000	4	2	0	0	2	14	17	5
Wisconsin:									
Kenosha	52,700	21	2	0	0	0	2	1	0
Milwaukee	517,000	63	17	18	1	1	4	51	6
Racine	69,400	5	2	0	0	0	1	2	1
Superior	[1] 39,671	1	0	1	0	0	0	6	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	4	1	0	0	0	1	5	1
Minneapolis	434,000	107	15	7	0	2	37	175	11
St. Paul	248,000	19	13	3	0	0	0	67	7
Iowa:									
Davenport	[1] 52,469	4	1	0	0	--------	0	0	--------
Des Moines	146,000	0	2	0	0	--------	0	0	--------
Sioux City	78,000	--------	2	--------	--------	--------	--------	--------	--------
Waterloo	36,900	4	0	0	0	--------	2	9	--------
Missouri:									
Kansas City	375,000	36	7	3	0	3	46	208	13
St. Joseph	78,400	2	1	0	1	0	0	12	3
St. Louis	830,000	19	42	45	2	0	158	18	--------

[1] Estimated, July 1, 1925.
[2] No estimate made.

City reports for week ended March 10, 1928—Continued

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
WEST NORTH CENTRAL—continued									
North Dakota:									
Fargo	[1] 26,403		1						
Grand Forks	[1] 14,811	0	0	0	0		1	0	
South Dakota:									
Aberdeen	[1] 15,036	6	0	0	0		0	0	
Sioux Falls	[1] 30,127	0	1	0	0		1	0	
Nebraska:									
Lincoln	62,000	23	1	1	0	0	1	36	0
Omaha	216,000	20	3	6	0	0	0	2	7
Kansas:									
Topeka	56,500	32	1	1	2	1	0	8	2
Wichita	92,500	13	2	2	0	0	1	2	3
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	1	2	2	0	0	2	11	5
Maryland:									
Baltimore	808,000	105	29	27	31	2	791	20	43
Cumberland	[1] 33,741	1	1	0	0	0	0	0	1
Frederick	[1] 12,035	0	0	0	0	0	1	0	0
District of Columbia:									
Washington	528,000	23	13	15	4	3	102	0	19
Virginia:									
Lynchburg	30,500	1	1	6	0	1	26	1	2
Norfolk	174,000	35	1	2	0	0	96	0	8
Richmond	189,000	3	2	3	0	0	159	2	9
Roanoke	61,900	7	0	3	0	0	19	0	2
West Virginia:									
Charleston	50,700	0	0	0	0	0	0	0	1
Wheeling	[1] 56,208	3	1	1	0	0	8	0	2
North Carolina:									
Raleigh	[1] 30,371	8	0	3	0	0	87	0	2
Wilmington	37,700	6	0	0	0	0	11	0	8
Winston-Salem	71,800	5	1	0	0	0	190	17	3
South Carolina:									
Charleston	74,100	2	0	0	17	0	5	1	4
Columbia	41,800	15	1	0	0	0	48	33	3
Greenville	[1] 27,311	1	0	0	0	0	13	8	8
Georgia:									
Atlanta	(2)	9	3	9	25	4	5	12	9
Brunswick	[1] 16,809	0	0	0	0	0	15	0	1
Savannah	94,900	1	0	0	9	3	10	2	2
Florida:									
Miami	[1] 69,754	2	6	2	0	0	0	1	3
St. Petersburg	[1] 26,847		0			0			2
Tampa	102,000	5	2	0	0	1	0	2	0
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	1	1	0	0	0	23	0	3
Louisville	311,000		4						
Tennessee:									
Memphis	177,000	12	4	3	0	0	60	21	11
Nashville	137,000	7	1	5	0	0	23	1	8
Alabama:									
Birmingham	211,000	14	2	2	15	6	50	10	15
Mobile	66,800	0	0	1	5	1	0	0	3
Montgomery	47,000	15	1	1	0		19	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	1	1	0	0		0	2	
Little Rock	75,900	1	0	0	3	0	81	6	6
Louisiana:									
New Orleans	419,000	3	10	24	22	9	1	0	23
Shreveport	59,500	10	0	0	0	3	156	1	3
Oklahoma:									
Oklahoma City	(2)	4	1	2	12	3	15	14	7
Tulsa	133,000	37	1	0	0		2	39	

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended March 10, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
WEST SOUTH CENTRAL—continued									
Texas:									
Dallas	203,000	31	5	3	0	0	1	1	2
Galveston	49,100	0	1	1	0	0	0	0	2
Houston	[1] 164,954	6	3	12	0	1	39	0	7
San Antonio	205,000	3	2	2	0	5	45	0	19
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	1	0	0	0	0	1	2
Great Falls	[1] 29,883	6	0	0	0	0	1	0	0
Helena	[1] 12,037	0	0	0	0	0	0	0	2
Missoula	[1] 12,608	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	-------	0	-------	-------	-------	-------	-------	-------
Colorado:									
Denver	285,000	49	10	8	0	5	27	105	17
Pueblo	43,900	3	1	0	0	0	1	0	1
New Mexico:									
Albuquerque	[1] 21,000	6	1	1	0	0	39	0	0
Utah:									
Salt Lake City	133,000	13	3	3	0	2	3	6	8
Nevada:									
Reno	[1] 12,665	0	1	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	24	6	13	0	-------	217	12	-------
Spokane	109,000	14	3	1	0	-------	0	0	-------
Tacoma	106,000	9	2	0	0	0	7	27	1
Oregon:									
Portland	[1] 282,383	31	7	2	2	0	14	4	3
California.									
Los Angeles	(2)	115	39	42	27	4	76	48	24
Sacramento	73,400	5	1	0	1	1	14	6	4
San Francisco	567,000	121	21	11	1	1	40	53	7

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	4	10	0	0	0	0	0	0	0	8	-------
New Hampshire.											
Concord	0	0	0	0	0	2	0	0	0	0	11
Manchester	2	3	0	0	0	1	0	0	0	0	23
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	4
Burlington	1	0	1	0	0	0	0	0	0	0	11
Massachusetts:											
Boston	77	73	0	0	0	13	2	0	0	57	[illegible]
Fall River	4	10	0	0	0	4	1	1	0	1	32
Springfield	7	23	0	0	0	1	0	0	0	2	-------
Worcester	10	4	0	0	0	3	0	0	0	24	43
Rhode Island:											
Pawtucket	1	0	0	0	0	1	0	0	0	[illegible]	23
Providence	9	32	0	0	0	6	0	0	0	9	72
Connecticut:											
Bridgeport	12	3	0	0	0	3	0	0	0	1	46
Hartford	7	7	0	0	0	3	0	0	0	7	49
New Haven	11	2	0	0	0	1	0	0	0	27	49

[1] Estimated, July 1, 1925.

[2] No estimate made

City reports for week ended March 10, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
MIDDLE ATLANTIC											
New York:											
Buffalo	23	35	0	0	0	13	0	0	0	50	177
New York	30	466	0	0	0	94	7	8	1	145	1,622
Rochester	15	4	0	0	0	3	0	0	0	3	76
Syracuse	13	19	0	0	0	3	1	0	0	50	70
New Jersey:											
Camden	6	0	0	0	0	3	0	0	0	0	35
Newark	34	53	0	0	0	9	0	0	0	30	146
Trenton	5	4	0	0	0	0	1	0	0	2	49
Pennsylvania:											
Philadelphia	87	94	1	0	0	32	2	1	0	99	592
Pittsburgh	31	27	0	0	0	12	0	2	0	14	227
Reading	4	32	0	0	0	0	0	0	0	1	30
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	19	30	1	0	0	11	0	0	0	12	161
Cleveland	52	34	1	0	0	18	1	1	0	78	198
Columbus	11	12	1	0	0	2	0	1	0	4	68
Toledo	14	6	2	0	0	8	1	0	1	11	74
Indiana:											
Fort Wayne	5	4	1	0	0	3	0	0	0	1	82
Indianapolis	11	14	12	6	0	7	0	4	0	11	100
South Bend	4	1	1	0	0	0	0	0	0	2	20
Terre Haute	3	0	0	5	0	1	0	0	0	0	16
Illinois:											
Chicago	133	137	2	7	0	55	2	0	0	182	830
Springfield	2	18	0	2	0	4	0	0	0	2	22
Michigan:											
Detroit	97	117	2	0	0	29	1	0	0	96	324
Flint	8	16	1	2	0	1	0	0	0	12	36
Grand Rapids	11	5	1	0	0	0	0	0	0	3	37
Wisconsin:											
Kenosha	3	2	1	0	0	0	0	0	0	4	6
Milwaukee	28	49	2	0	0	9	0	0	0	19	118
Racine	5	8	1	0	0	2	0	0	0	4	15
Superior	3	0	1	0	0	0	1	0	0	0	10
WEST NORTH CENTRAL											
Minnesota:											
Duluth	9	10	1	0	0	1	0	0	0	0	20
Minneapolis	60	29	5	0	0	3	1	0	0	14	94
St. Paul	34	13	6	0	0	8	1	0	0	13	77
Iowa:											
Davenport	2	3	3	0	-------	-------	0	0	-------	0	-------
Des Moines	6	17	1	14	-------	-------	0	0	-------	0	30
Sioux City	2	-------	1	-------	-------	-------	0	-------	-------	-------	-------
Waterloo	2	3	1	1	-------	-------	0	0	-------	2	-------
Missouri:											
Kansas City	12	32	4	2	0	7	0	0	0	17	115
St. Joseph	3	5	0	11	0	0	1	0	0	0	32
St. Louis	35	42	5	2	0	14	1	1	0	26	285
North Dakota:											
Fargo	3	-------	0	-------	-------	-------	0	-------	-------	-------	-------
Grand Forks	0	3	0	0	-------	-------	0	0	-------	0	-------
South Dakota:											
Aberdeen	4	0	0	0	-------	-------	0	0	-------	4	-------
Sioux Falls	3	0	0	0	-------	-------	0	0	-------	0	8
Nebraska:											
Lincoln	2	3	0	4	0	0	0	0	0	6	6
Omaha	3	7	10	7	0	2	0	0	0	0	57
Kansas:											
Topeka	3	3	1	5	0	1	0	0	0	2	23
Wichita	3	4	1	19	0	1	0	0	0	1	30

City reports for week ended March 10, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	2	0	0	0	0	0	0	0	0	33
Maryland:											
Baltimore	41	30	0	1	0	20	2	0	0	41	241
Cumberland	0	1	0	0	0	2	0	0	0	0	13
Frederick	1	2	0	0	0	0	0	0	0	0	5
Dist. of Columbia:											
Washington	27	58	1	1	0	0	1	0	0	12	144
Virginia:											
Lynchburg	0	2	0	0	0	0	0	0	0	6	9
Norfolk	2	25	0	1	0	1	0	0	0	5	
Richmond	3	9	0	0	0	5	0	1	0	0	57
Roanoke	0	2	1	0	0	1	0	0	0	1	13
West Virginia:											
Charleston	1	4	0	0	0	0	0	0	0	0	9
Wheeling	1	1	0	0	0	1	0	1	0	0	17
North Carolina:											
Raleigh	0	2	0	0	0	1	0	0	0	0	18
Wilmington	0	1	0	0	0	0	0	0	0	2	8
Winston-Salem	1	1	4	0	0	1	0	0	0	0	18
South Carolina:											
Charleston	0	3	1	1	0	0	0	0	0	1	19
Columbia	0	0	0	0	0	0	0	0	0	4	12
Greenville	0	0	1	0	0	1	0	0	0	1	11
Georgia:											
Atlanta	4	7	7	2	0	6	1	0	0	0	80
Brunswick	0	0	1	0	0	1	0	1	1	0	6
Savannah	1	1	1	7	0	8	0	2	1	0	36
Florida:											
Miami	1	0		0	0	1	1	0	0	0	36
St. Petersburg	0		0		0	0	0		0		12
Tampa	0	2	0	1	0	2	2	0	0	2	32
EAST SOUTH CENTRAL											
Kentucky:											
Covington	3	4	0	1	0	2	0	0	0	0	25
Louisville	6		1				0				
Tennessee:											
Memphis	4	12	3	0	0	4	0	0	0	2	80
Nashville	4	2	1	0	0	4	0	0	0	0	54
Alabama:											
Birmingham	3	2	7	1	0	3	1	0	0	2	81
Mobile	0	5	0	1	0	3	0	1	2	0	26
Montgomery	1	0	0	0			0	0		1	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	2	1	0			0	0		2	
Little Rock	2	4	0	0	0	1	0	0	0	0	
Louisiana:											
New Orleans	7	10	0	0	0	11	2	1	0	4	174
Shreveport	0	5	1	0	0	2	0	0	0	4	38
Oklahoma:											
Oklahoma City	2	3	3	22	0	1	0	0	0	0	33
Tulsa	1	19	2	8			0	0		5	
Texas:											
Dallas	3	4	6	5	0	6	0	0	0	5	42
Galveston	0	1	1	0	0	0	0	0	0	0	8
Houston	1	2	2	4	0	1	0	0	0	0	56
San Antonio	1	4	0	0	0	13	0	0	0	0	67
MOUNTAIN											
Montana:											
Billings	1	0	0	0	0	0	0	0	0	1	11
Great Falls	1	2	1	5	0	0	0	0	0	1	4
Helena	0	1	0	0	0	0	0	0	0	0	7
Missoula	1	0	0	0	0	0	0	0	0	0	6

City reports for the week ended March 10, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths all causes
MOUNTAIN—con.											
Idaho:											
Boise	0		1				0				
Colorado:											
Denver	15	12	2	0	0	11	1	0	0	9	100
Pueblo	3	2	0	0	0	0	1	0	0	6	9
New Mexico:											
Albuquerque	2	2	0	0	0	5	0	0	0	0	12
Utah:											
Salt Lake City	3	5	1	8	0	0	0	0	0	14	31
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	4
PACIFIC											
Washington:											
Seattle	11	1	5	1			1	0		6	
Spokane	6	7	6	26			0	0		0	
Tacoma	3	4	4	0	0	1	1	1	0	7	21
Oregon:											
Portland	6	7	10	44	0	3	1	1	0	0	69
California:											
Los Angeles	31	20	7	0	0	29	2	0	0	10	293
Sacramento	2	5	1	0	0	1	0	0	0	0	24
San Francisco	16	38	5	0	0	17	1	0	0	13	176

Division, State, and city	Cerebrospinal meningitis: Cases	Cerebrospinal meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	0	0	0	1	0	0	1	0
Worcester	1	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
Buffalo	1	1	0	0	0	0	0	0	0
New York	17	6	3	2	0	0	1	0	0
New Jersey:									
Newark	0	0	1	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	2	3	0	0	0	0	0	0	0
Pittsburgh	3	2	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	0	1	0	1	0	1	0	0	0
Cleveland	2	0	0	0	0	0	0	0	0
Columbus	0	0	0	0	0	0	0	1	1
Toledo	0	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	1	4	0	0	0	0	0	0	0
Illinois:									
Chicago	9	7	1	0	0	0	1	1	1
Michigan:									
Detroit	1	0	1	0	0	0	1	0	0
Wisconsin:									
Milwaukee	3	2	0	0	0	0	0	0	0

City reports for the week ended March 10, 1928—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
WEST NORTH CENTRAL									
Minnesota:									
Duluth	0	0	0	1	0	0	0	0	0
Minneapolis	0	0	1	1	0	0	0	0	0
Missouri:									
Kansas City	0	1	0	0	0	0	0	1	0
St. Louis	4	1	0	0	0	0	1	0	0
SOUTH ATLANTIC									
Virginia:									
Norfolk	1	0	0	0	0	0	0	0	0
Roanoke	0	0	0	0	0	1	0	0	0
North Carolina:									
Raleigh	0	0	0	0	0	0	0	0	1
Wilmington	0	1	0	0	0	0	0	0	0
South Carolina:									
Columbia	0	0	0	0	0	2	0	0	0
Georgia:									
Atlanta	0	0	0	0	1	2	0	0	0
Savannah	0	0	0	0	1	0	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Birmingham	0	0	0	0	2	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	1	1	0	0	2	1	0	0	0
Oklahoma:									
Tulsa	1		0		0		0	0	
Texas:									
Houston	1	1	0	0	0	0	0	0	0
MOUNTAIN									
Colorado:									
Denver	6	2	0	0	0	0	0	0	0
Pueblo	0	1	0	0	0	0	0	0	0
New Mexico:									
Albuquerque	1	1	0	0	0	0	0	0	0
Utah:									
Salt Lake City	1	0	0	0	0	0	0	0	0
Nevada:									
Reno	1	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Spokane	3		0		0		0	0	
Oregon:									
Portland	1	0	0	0	0	0	0	1	0
California:									
Los Angeles	1	0	0	0	0	0	1	2	0
Sacramento	0	0	0	0	0	0	0	1	0
San Francisco	3	1	0	0	0	0	0	0	0

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended March 10, 1928, compared with those for a like period ended March 12, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927

and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below:

Summary of weekly reports from cities, February 5 to March 10, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928
101 cities	177	167	203	175	179	174	182	[2] 173	183	[3] 173
New England	174	136	133	172	149	138	163	140	128	145
Middle Atlantic	188	230	277	234	199	224	223	233	230	214
East North Central	179	175	168	169	198	169	176	164	165	171
West North Central	154	99	164	125	109	125	115	113	133	[4] 136
South Atlantic	222	112	191	149	191	156	195	130	155	124
East South Central	61	55	86	55	117	35	81	[2] 102	112	[3] 87
West South Central	149	128	170	124	104	188	149	92	199	168
Mountain	152	44	161	186	72	71	233	186	197	[5] 101
Pacific	167	133	188	82	151	161	133	141	198	171

MEASLES CASE RATES

	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928
101 cities	652	791	810	892	862	998	880	[2] 1, 123	952	[3] 1, 132
New England	339	1, 614	181	1 657	228	1, 908	172	1, 979	198	1, 657
Middle Atlantic	45	647	68	700	74	877	67	1, 000	80	970
East North Central	786	440	1, 009	531	1, 015	565	1, 173	761	1, 169	865
West North Central	683	216	564	240	960	255	952	341	1, 241	[4] 498
South Atlantic	359	1, 959	792	2, 246	651	2, 406	794	2, 576	783	2, 784
East South Central	451	1, 132	467	1, 347	461	1, 202	538	[2] 1, 600	314	[3] 1, 272
West South Central	451	1, 304	562	1, 899	591	1, 959	720	1, 695	1, 187	1, 300
Mountain	7, 845	186	9, 665	97	10, 624	168	8, 132	142	9, 091	[5] 295
Pacific	2, 220	718	2, 774	692	2, 865	749	3, 030	892	3, 252	904

SCARLET FEVER CASE RATES

	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928
101 cities	390	300	438	291	424	295	418	[2] 293	446	[3] 302
New England	537	432	470	441	542	414	423	347	591	377
Middle Atlantic	423	333	581	330	531	335	532	345	583	358
East North Central	325	310	322	280	366	285	309	309	369	292
West North Central	499	290	540	265	445	275	448	261	471	[4] 301
South Atlantic	258	231	249	228	218	282	180	254	193	268
East South Central	223	135	243	190	183	185	218	[2] 116	279	[3] 182
West South Central	74	100	66	116	116	120	66	96	120	128
Mountain	1, 246	540	1, 246	345	1, 192	208	1, 076	257	1, 112	[5] 203
Pacific	389	192	340	230	313	233	329	194	285	192

SMALLPOX CASE RATES

	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928
101 cities	26	21	33	20	25	24	21	[2] 17	30	[3] 23
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	15	14	28	12	15	13	21	18	24	14
West North Central	71	109	81	101	63	92	53	62	53	[4] 95
South Atlantic	63	21	60	26	45	26	82	19	54	25
East South Central	81	15	132	25	71	40	122	[2] 0	81	[3] 22
West South Central	66	16	62	20	50	6	50	20	70	36
Mountain	18	44	27	168	0	62	0	53	0	[5] 120
Pacific	76	69	94	18	104	125	18	49	94	69

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] Louisville, Ky., not included.
[3] Sioux City, Iowa; Fargo, N. Dak.; Louisville, Ky.; and Boise, Idaho, not included.
[4] Sioux City, Iowa, and Fargo, N. Dak., not included.
[5] Boise, Idaho, not included.

Summary of weekly reports from cities, February 5 to March 10, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued.

TYPHOID FEVER CASE RATES

	Week ended—									
	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928
101 cities	7	7	9	5	8	5	9	[2] 10	8	[3] 4
New England	5	9	2	5	9	7	2	0	12	2
Middle Atlantic	5	6	10	3	1	5	5	8	8	3
East North Central	3	6	4	3	6	1	6	7	1	4
West North Central	6	6	10	4	8	4	10	6	4	[4] 2
South Atlantic	18	9	23	7	29	9	23	12	11	9
East South Central	10	5	30	15	25	20	41	[2] 73	30	[2] 7
West South Central	12	40	8	12	4	16	8	32	17	4
Mountain	0	0	0	0	18	0	9	9	0	[5] 0
Pacific	18	0	3	8	8	5	8	8	10	3

INFLUENZA DEATH RATES

	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928
95 cities	24	17	23	22	22	21	25	[2] 24	27	[6] 23
New England	2	7	9	11	12	7	9	7	12	21
Middle Atlantic	28	15	25	18	22	24	24	16	25	19
East North Central	22	10	19	12	17	14	23	17	16	16
West North Central	14	4	23	6	10	2	17	10	14	[7] 12
South Atlantic	23	30	31	35	41	28	47	32	70	25
East South Central	37	42	43	37	43	31	21	[2] 125	80	[2] 55
West South Central	38	57	38	90	25	74	38	103	47	74
Mountain	72	53	27	71	54	35	54	88	54	[5] 64
Pacific	21	20	17	27	17	20	17	24	7	20

PNEUMONIA DEATH RATES

	Feb. 12, 1927	Feb. 11, 1928	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928
95 cities	147	168	146	174	163	161	17	[2] 188	188	[6] 191
New England	165	149	102	170	184	147	202	193	188	205
Middle Atlantic	173	200	148	195	176	155	193	217	222	221
East North Central	128	114	121	137	145	156	132	148	157	156
West North Central	95	106	91	94	91	71	104	106	81	[7] 97
South Atlantic	168	224	234	216	253	228	229	217	272	214
East South Central	117	235	175	204	122	220	271	[2] 249	186	[2] 312
West South Central	144	201	204	279	161	271	183	283	161	254
Mountain	143	150	188	168	134	248	126	265	170	[5] 276
Pacific	114	182	176	172	131	115	121	155	148	122

[2] Louisville, Ky., not included.
[3] Sioux City, Iowa; Fargo, N. Dak.; Louisville, Ky.; and Boise, Idaho, not included.
[4] Sioux City, Iowa, and Fargo, N. Dak., not included.
[5] Boise, Idaho, not included.
[6] Fargo, N. Dak., Louisville, Ky., and Boise, Idaho, not included.
[7] Fargo, N. Dak., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended February 25, 1928.—The following report for the week ended February 25, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Suez.
Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Ceylon.—Colombo.
Straits Settlements.—Singapore.
Dutch East Indies.—Makassar.

CHOLERA

India.—Bassein, Calcutta, Madras, Negapatam, Rangoon.
Siam.—Bangkok.
French Indo-China.—Saigon.

SMALLPOX

Egypt.—Alexandria.
Ceylon.—Colombo.
India.—Bombay, Calcutta, Cochin, Madras, Moulmein, Rangoon, Vizagapatam.
French India.—Pondicherry.
French Indo-China.—Saigon.
Dutch East Indies.—Belawan-Deli, Pontianak.
China.—Shanghai, Hong Kong.

Returns for the week ended February 25 were not received from the following ports:

Dutch East Indies.—Banjermassin, Samarinda.
Kuantung.—Port Arthur, Dairen, towns of the South Manchurian Railway zone.
Union of Socialist Soviet Republics.—Vladivostok.

ARABIA

Aden—Plague—January 9–February 22, 1928.—A total of 303 cases of plague with 188 deaths has been reported at Aden for the period January 9 to February 22, 1928.

BELGIAN CONGO

Matadi—Yellow fever—January 26–February 19, 1928.—During the period January 26 to February 6, 1928, 8 cases of yellow fever with 6 deaths were reported at Matadi, Belgian Congo. Of these, three cases with two deaths were in Europeans.

A suspect case of yellow fever was reported at the quarantine station of Ango Ango, below Matadi, February 9, 1928. The patient died February 10.

Quarantine was lifted at Matadi on February 19, 1928.

CANADA

Provinces—Communicable diseases—Week ended March 10, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended March 10, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever				1				1
Influenza	12			13		3		28
Smallpox				20		7	7	34
Typhoid fever		2	7	8			1	18

Quebec Province—Communicable diseases—Week ended March 10, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended March 10, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	50	Scarlet fever	80
Diphtheria	53	Smallpox	18
German measles	21	Tuberculosis	59
Influenza	4	Typhoid fever	7
Measles	293	Whooping cough	29

CUBA

Santiago de Cuba—Malaria—March 17, 1928.—Under date of March 17, 1928, 136 cases of malaria were reported at Santiago de Cuba.

CZECHOSLOVAKIA

Communicable diseases—January, 1928.—During the month of January, 1928, communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	4		Paratyphoid fever	6	1
Cerebrospinal meningitis	25	3	Puerperal fever	55	21
Diphtheria	937	71	Scarlet fever	1,372	36
Dysentery	10		Trachoma	226	
Malaria	1		Typhoid fever	455	34

EGYPT

Suez—Plague—February 19-March 1, 1928.—During the week ended February 25, 1928, four cases of plague were reported at Suez, Egypt. On March 1, 1928, a fatal septicemic case was reported.

From January 1 to February 25, 1928, 17 cases of plague were reported at Suez, as compared with 13 cases during the corresponding period of 1927.

ESTONIA

Communicable diseases—January, 1928.—During the month of January, 1928, communicable diseases were reported in the Republic of Estonia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	7	Scarlet fever	402
Diphtheria	48	Tuberculosis	181
Measles	50	Typhoid fever	49

Population, estimated, 1,114,630.

GREAT BRITAIN

Leeds, England—Smallpox.—Under date of March 5, 1928, two outbreaks of smallpox were reported in the Leeds consular district, with 11 cases. Both outbreaks were stated to be mild. The first outbreak occurred in the small mining village of Swillington, with 8 cases. At Leeds, three cases were reported March 1, 1928.

JAPAN

Influenza—January 1-February 10, 1928.—The Home Office of Japan, at Tokyo, has published a statement that there were 27,411 cases of influenza with 395 deaths in Japan from January 1 to February 10, 1928. On March 17, 1928, conditions were said to have greatly improved.

PERU

Arequipa—Mortality from communicable diseases—December, 1927—January, 1928.—Mortality from communicable diseases was reported at Arequipa, Peru, during the months of December, 1927, and January, 1928, as follows:

Disease	Deaths		Disease	Deaths	
	December, 1927	January, 1928		December, 1927	January, 1928
Gastroenteritis	15	11	Scarlet fever	1	
Influenza		2	Tuberculosis	11	28
Measles		1	Typhus fever	1	2

Population: 44,300 in January, 1928.

General mortality.—The total number of deaths from all causes reported at Arequipa for the months of December, 1927, and January, 1928, was 61 and 92, respectively.

Prevailing diseases.—Diseases prevalent at Arequipa were stated to be bronchitis, pneumonia and broncho-pneumonia, enteritis and gastroenteritis in children; a few cases of smallpox, tuberculosis, typhoid fever, and typhus fever.

SENEGAL

Plague—January, 1928.—During the month of January, 1928, five cases of plague were reported in Senegal, occurring in the interior.

SYRIA

Beirut—Smallpox outbreak—January-February, 1928.—Under date of February 23, 1928, an outbreak of epidemic smallpox was reported at Beirut, Syria, with 46 cases reported from January 26 to February 19, 1928.

URUGUAY

Montevideo—Communicable diseases—November, 1927.—During the month of November, 1927, communicable diseases were reported at Montevideo, Uruguay, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	28	3	Tuberculosis	145	95
Measles	59	6	Typhoid fever	4	3
Scarlet fever	14				

Population, estimated, 439,129.

VENEZUELA

Tacata and Cua, State of Miranda—Plague—March 11, 1928.—Under date of March 14, 1928, plague was reported at Tacata and Cua, in the State of Miranda, Venezuela, about 100 kilometers from Caracas, near the State of Aragua. The last case was said to have been reported March 11. Precautions against the spread of the disease were taken.

VIRGIN ISLANDS

Communicable diseases—February, 1928.—During the month of February, 1928, communicable diseases were reported in the Virgin Islands of the United States as follows:

Island and disease	Cases	Remarks
St. Thomas and St. John:		
Chancroid	2	
Gonorrhea	3	
Leprosy	2	Secondary, 2.
Pellagra	1	
Syphilis	3	Secondary, 2.
Whooping cough	1	
St. Croix:		
Syphilis	3	Secondary.
Uncinariasis	7	Necator americanus.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
China:																				
Amoy	C	2	28	72	16															
	D		7	3																
Canton	C	8	31	36	14	12		1												
	D	5	16	25	14	11		1												
Foochow	C	P	P	P	P															
Hong Kong	C	2	P	1	P															
	D	1																		
Shanghai (settlement and concession)— Foreigners only	C		1	6	3															
Including natives	D		20	74	7															
Swatow	C	72	42	P	P	P														
	D	1		P	P	P														
Tientsin	C	P	P	15	2	P			1											
Dutch East Indies: Java—Batavia	C					28	2	1												
	D					18	2	1												
India	C	46,137	45,163	31,390	20,160	23,047	8,102	5,997	5,766	5,274	4,624	3,960	3,550	3,243	3,267					
	D	24,081	22,051	15,995	10,371	12,863	4,835	3,672	3,356	3,164	2,617	2,353	2,046	1,847	1,765					
Bassein	D	16															1			1
Bombay	C	75	42	3		2										1				
	D	35	30	2		2														
Calcutta	C	95	87	76	101	199	156	119	87	66	69	42	43	22	39	36	70	58		
	D	48	40	39	64	138	106	77	55	43	48	34	27	16	18	24	38	32	35	42
Madras	C	424	547	59	14	13			1					1	1			1	2	
	D	204	278	48	8	7	1		1					1		3		1		
Madras Presidency	C	11,491	7,660	3,056	2,050	3,073	1,484	861	878	479	503	382	482		1,163					
	D	4,807	3,518	1,581	1,055	1,736	802	526	491	283	241	209	254		628					
Negapatam	C														4					
	D														4	1		1	2	2
Rangoon	C	2	1	2	6	2	3	1	2	2	1	2		1	4		1	1		
	D	2	1	2	5	5	2	1	2	1	1	1		1			1	1	3	4
Tuticorin	C				1			6		2										
	D				1	37		6	6	2										

India (French):																				
Chandernagor	C	1	1	1		6	2	2	2	2	6	3	4	1	1					
	D	1	1			6	2	2	2	2	4	2	2	1						
Karikal	C	56	18	1		1				1			6	2	9	7				
	D	45	12	1		1				1			4		5	4				
Pondicherry	C	37	12	15		1		5	3	17	4	1	2	4	2	3				
	D	24	11	15		1		5	1	15	6	1	2	3	2	3				
Indo-China: Saigon	C			1	1								2	1	1	1		2	1	5
	D												1					1	1	1
Iraq [1]																				
Japan: Yokohama	C	1																		
	D	1																		
Philippine Islands: Manila	C	1	1																	
Siam	C	81	77	40	18	110	19	29	18	32	24	24	13	49	50	33	48			
	D	59	53	24	11	76	11	19	13	21	18	21	5	36	34	21	42			
Bangkok	C	6	2	3	5	4		1	1	1	2	3	7	9	11	28	28	24	23	17
	D	1	1	1	3	2		1		1	2	1	3	5	7	16	26	17	12	11
Straits Settlements: Singapore	C					7	1	2		2	3	15	3	2	2			1		
	D					5	2			2	1	4	5	2	1					
On vessel:																				
S. S. Adrastus: At Yokohama, Japan	C		1																	
	D		1																	
S. S. Tabaristan: At Basra, Iraq	C				1															

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928	
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20
Indo-China (French):																
Annam	C	911	1,626	640	226	13	75	38	16	2		79	95	93	23	36
Cambodia	C	87	89	75	180	56	1	28	21	12	39	30	9	15	38	22
Cochin-China	C	257	68	144	178	21	27	52	17	38	58	46	119	130	178	113
Laos	C	20	190	36	67	10										
Tonkin	C	1,093	180	24	1			1			2	1				
Kwangchow-wan	C		1	15												

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths, Diwanian Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov 19, 1927	Week ended—															
						Nov. 26, 1927	December, 1927					January, 1928				February, 1928				March, 1928	
							3	10	17	24	31	7	14	21	28	4	11	18	25	3	10
Algeria: Oran	C	4	1		2																
	D	3	1																		
Arabia: Aden	C												19	13	22	54	89	63	45	77	
	D												7	8	8	33	55	50	31	26	
Argentina:																					
Bahia Blanca district	C					1	1	1													
Buenos Aires	C																2				
Cordoba Province	C	2		P	P	10				1	1										
Entre Rios	C	5																			
Firmat	C								1												
Quilino	C					1	1	1													
Rosario	C					1	1	1	1	2	3				4			1			
Santiago Province	C																	1			
Ucacha	C								1												
Azores: St. Michaels Island	C	2	2	3	3	1	1	1		1		1		3	1	2	2				
	D		1	1				1					1	1	1	1	1				
Brazil:																					
Porto Alegre																				2	
Rio de Janeiro	C													1		1	2	3			
	D																1				
British East Africa:																					
Tanganyiki	C	P		P	P	P	P	P	P	P											
Uganda	C	456	226	99	99	24	27	16													
	D	345	158	88	96	21	25	15													
Canary Islands:																					
Las Palmas	C			9		1			2			2	1	1			1				
	D												1	1			1				
Teneriffe	C													1	3	3	8				
	D													1		3					
Ceylon: Colombo	C	1	3	1		1	1		4	3	2	1	1	1	1	1		3	3	4	
	D		3					2	4	3	1	1	1	1	1			1	3	1	
China:																					
Tientsin	C	2																			
Tungliao	D			200																	

Dutch East Indies:																					
Balik-Papan	C									1											
	D									1											
Celebes—Makassar	C				6	1		1		2	1		3	2	1	1	1		1		
	D				6	1		1		2	1		2	2	1	1	1		1		
Java	D		432	779	829	291	275	251	200	209	179										
Batavia and West Java	C	71	68	130	132	45	43	32	34	32	36	24	36	46	37	27					
	D	71	68	129	132	44	43	32	33	32	36	24	36	44	37	27					
Cheribon	C						1														
	D						1														
East Java and Madura	C	28	18	17	10	5	3			3	2	1	1	5	2						
	D	27	18	17	10	5	3			3	2	1	1	5	2						
Pasoeroean Residency	C					P	P	P													
Surabaya Residency	C						P														
Surakarta Residency	C				P	P	P														
Egypt:																					
Alexandria	C	2	1			5	3	2	2	3	2					1		1			
	D					5	2			1	1					1		1			
Suez	C		1										1	1		3		3	4		
	D												1	1		1		3	3	2	
Greece:																					
Athens and Piraeus	C	1	3	1							2	1									
	D			1							1										
Mitylene	C	1	5	1	3	1	1	1													
Patras	C	2	2	1	1																
	D			1	1																
Hawaii Territory: Hawaii	D	1																1			
India	C	1,391	2,710	3,246	3,600	1,193	1,228	1,348	1,749	1,085	1,197	2,596	2,219	2,544							
	D	836	1,428	1,792	2,065	668	742	773	1,085	733	899	1,804	1,498	1,653							
Bassein	D	12	14	8	4	3			1	2	13	2		3	3		2	1	2	4	
Bombay	C	14	7	4							1		2	5	4	2					
	D	11	5	3							1		1	2	2	3	2	6	14	7	
Calcutta	C		18																		
	D		10												1						
Madras Presidency	C	620	465	583	470	190	158	220	223	174	167	56	153	107	132						
	D	321	230	298	282	111	61	108	79	69	27	38	72	63	64						
Rangoon	C	15	6	11	11	5	2	6	2	2	4	4	7	8	9	7	11				
	D	14	6	11	11	5	2	5	3	2	3	4	7	7	7	6	10	12	15	6	
Indo-China: Saigon	C		2		1																
Iraq:																					
Baghdad	C													1	1		2				
	D													1			1				
Dulaim Liwa	C															1					
Nigeria: Lagos	C				17	4	3	4	2	2	1	1	6	2	3	3	2	2	3		
	D				17	4	3	3	3	1	1	1	5	3	3	3	2	2	3		
Senegal:[1]																					
Baol	C	23	72	95	P		P														
	D	13	33	40																	
Cayor	C	227	463	176	48																
	D	166	233	88	28																
Dakar	C	46	20	1																	
	D	32	12																		

[1] During January, 1928, 5 cases were reported in interior of Senegal.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	February, 1928 4	11	18	25	March, 1928 3	10
Senegal—Continued.																					
Louga	C		5	8																	
	D		4																		
Rufisque	C	44	16																		
	D	38	12																		
Thies	C		9	1	1																
	D		7																		
Siam	C			13	1	2			1	1	7	4	4	5	3	6					
	D			9		1			1	1	1	5	4	1	1	5					
Bangkok	C			2							1				1		1				
	D				1						1				1		1				
Straits Settlements: Singapore	C				1											1	1	1			
	D				1											1	1	1			
Turkey: Constantinople	C		1	1		1	1														
	D			1			1														
Union of South Africa:																					
Cape Province	C				2			2						1							
	D				2			1						1							
Orange Free State	C				1	8	P								2						
	D				1	6									1						
U. S. S. R.:																					
Chita district	C			1																	
	D			1																	
Northern Caucasus	C		14	1																	
	D		10																		
Venezuela [2]																					
On vessel:																					
At La Plata, from Rosario, Argentina	C										1										
S. S. Aghios Gerasimos at, Vigo Spain	C				3																

Place		July	August	September	October	November	December	January
Algeria: Algiers	C				2			
British East Africa: Kenya	C	13	61	21	18	28	16	26
Ecuador: Guayaquil	C	5	7	3	4	9	5	4
	D					3	2	4
Indo-China (French)	C			14	3	3	4	7
Madagascar	C	46	98	170	166	209	317	
	D	43	89	154	155	189	261	
Ambositra Province	C	6	1		6	1	18	
	D	6	1		6	1	10	
Antsirabe Province	C		34	5	19	18	72	
	D		34	4	19	17	72	
Itasy Province	C	14	11	21	16	26	63	
	D	14	7	20	15	25	54	
Moramanga Province	C	5	4	3	24	46	25	
	D	5	4	3	20	41	22	
Madagascar—Continued.								
Tananarive Province	C	21	48	142	99	170	139	
	D	19	43	127	98	153	108	
Mauritius	C			1				
Nigeria	C	9	8	15	27	16	20	16
	D	7	8	14	27	16	18	16
Peru	C	8	11	15	14	6	14	
	D	7	6	6	5	2	4	
Callao	D	3					3	
Lima	C						7	
	D				1	1	1	
Syria: Beirut	C						2	

SMALLPOX

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Week ended— Nov. 26, 1927	Dec. 3, 1927	Dec. 10	Dec. 17	Dec. 24	Dec. 31	Jan. 7, 1928	Jan. 14	Jan. 21	Jan. 28	Feb. 4, 1928	Feb. 11	Feb. 18	Feb. 25	Mar. 3, 1928	Mar. 10
Algeria	C	459	382	683	661		68	55	47	81	26	7	15	17	18	11					
Algiers	C								3	3	4		2	3	1	7					
Oran	C	9	16	11	20	9	11	10	9	8	15	2	4	2	2	4		1		2	
Arabia: Aden	C				1		1	1	1	1								1			
Brazil:																					
Para	C	1																			
Rio de Janeiro	C	6	10		1																
	D	4	9		1																
British East Africa: Tanganyika	D	21	8	P	P	P	P	P				2	6	4							
British South Africa:																					
Northern Rhodesia	C	55	39	164	185	57	15	125	55	2	81	141	12	3		230					
	D	1	2	11	64	18	7	28	9		8	23				23					
Southern Rhodesia	C				3				2	1							3	2			

[3] Plague was reported at Tacata and Cua, State of Miranda, Venezuela, Mar. 11, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths, P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct 23–Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	March, 1928: 3	10
Canada:																					
Alberta	C	17	17	23	10	7	3	3	6		3	3	5	1	19	1	6		3		7
Calgary	C	1																			
Edmonton	C			1	1	6		1	1			3	2	1			2	1		11	1
British Columbia: Vancouver	C		2					4		1	3	3	1	11	3	1	11	2	1		1
Manitoba	C	13	9	7	19	1	3	1	2	2	2	2	5		1						
Winnipeg	C	5	4	2	2			1	1	1			1	1	1						
New Brunswick	C		2							1									1		
Nova Scotia	C		1	1																	
Halifax	C			1																	
Ontario	C	60	22	96	264	71	90	82	104		53	83	76	52	77	63	51	40	51		20
Hamilton	C						2														
Kingston	C				1					1							1				
Ottawa	C	27	40	67	134	10	19		34	18	9	10	23	20	16	23	9	11	3	1	7
Toronto	C		2	10	34		25	14		7		11	10	8	5	1	6	4	4	2	4
Windsor	C			9																	
Quebec	C	1		8	25	8	5	3		14	3	10	17	7		11	8	11	13		18
Montreal	C				1					1		1	6	3	4	1		5	1	3	
Quebec	C						2		2		2		3		5				2	5	
Riviere du Loup	C				3																
Saskatchewan	C	14	68	31	34	9	15	19	15	12	13	15	12	39	15	9	34	7	8		7
Moose Jaw	C	10	16	3					1		1	2	1	4	2	3	2		2	6	5
Regina	C	8		5	1				1												
Saskatoon	C							2			4			13	1		1		2		
Ceylon: Colombo	C	1			1		2							1		1	2	2	1		
	D	1					1							1							
China:																					
Antung	C												1								
Canton	C		1																		
	D		1																		
Chefoo	C		1	P		P															
	D		1																		
Foochow	C	P	P	P	P	P		P	P	P	P		P		P		P				

	D	1	2									1			1				1		
Manchuria—																					
Changchun	C					1									4						
Dairen	C			1	2				1			2	3					1			
	D			1																	
Fushun	C		1		1																
Harbin	C								2		1				2						
Mukden	C			2	1										1		3	18			
Pensihu	C			1																	
Shanghai—																					
Foreigners only	C													1	2		2	1			
Including natives	D													3	2	3	3	5	4		
Tientsin	C		4	13	8	4	1	2	2	2			6	20	10	10	8				
Curacao (alastrim)	C													2				3			
Dutch East Indies:																					
Borneo—																					
Samarinda District	C				P																
South and East Borneo Residency	C	P																			
Java—																					
Batavia and West Java	C	4		4	25											1					
	D				15																
East Java and Madura	C	4	22	8	9	4	3	2			3	1	1	2							
	D			1																	
Sumatra: Medan	C								3		8		1	3	5	5	10				
	D								2		1		2	4	4		3				
Egypt	C		3				4				4										
	D		1	1				1													
Cairo	C					1	1														
Great Britain:																					
England and Wales	C	568	508	473	902	233	366	230	212	255	247	275	398	405	370	386	369	309	392	365	
Birmingham	C	1		1										14	17	11	2	1		2	
Bradford	C				11	9	6	2	2	2	2	4	24	6	9	7	2	7	1		
Bristol	C			6	4	2	1	2							2		1			1	
Cardiff	C				1							1									
Leeds	C	5	3	7	5	3	3	6	4	4	6	1		1			2	1	2	4	
Liverpool	C												1								
London	C													2		1	5	10	1	2	
Manchester	C			3	6	2	5	10	8		1	2	2	11	6	4	4	1	4	1	
Newcastle upon Tyne	C	1	2	6	9	28	18	5	4	2	13	2	5	14	3	4	6	4	1	4	
Nottingham	C											7	6	4	8	6	9	6	1	3	
Sheffield	C	2	1	10	6	1	8			3		1	10	4		4		1	2	2	
Stoke on Trent	C	1										3	1			1		2	4	3	
Greece: Saloniki	D	2																			
India	C	5,911	4,398	3,153	4,052	1,031	1,556	1,939	2,205	2,225	2,502	2,064	3,285	4,129							
	D	1,668	1,120	715	927	307	359	465	519	515	578	551	785	961							
Bassein	C	1															1				
	D	1																			
Bombay	C	33	12	10	4		4		5		1	4	6	10	23	19	18	29	23		
	D	19	8	2	3		1		1					2	8	7	7	15	13		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	March, 1928: 3	10
India—Continued.																					
Calcutta	C	27	22	5	5	4	3	11	7		17	9	14	14	11	23	10	9	18		
	D	25		6	2	2	1	6	2		17	4	6	10	7	10	7	5	11		
Madras	C	6	7	8	7	2	2	5	2	2		11	8	9	16	20	29	15	33		
	D		2		2	1	1	1		1		4	1	3	2	2	1	3	3		
Nagapatam	C	3	1										5		4	2	2	1			
	D	2	1										3		2	1					
Rangoon	C	14	9	17	6	5	2	1	6	36	28	23	49	41	34	103	97		82		
	D	3	2	3	1	1	1		2	5	13	4	9	13	10	18	23		24		
Vizagapatam	C		3									3		2	1	5	2		1		
	D		2											6	1		1				
India (French):																					
Karikal	C	3	1	2	P																
	D	3	1	2																	
Pondicherry	C	39	37	38	42	15	6	6	14	6	16	25	18	15							
	D	31	37	35	42	15	6	6	14	6	14	12	18	15							
Indo-China: Saigon	C	1	1						1		1	1	1								
Iraq:																					
Baghdad	C		1	7	5	1	5	7	12	9	9	3	2	7	6	5	3				
	D		1	4	4		5	4	5	7	3	2		3	3	2	1				
Basra	C	1	4	2	3		2	2			2			1							
	D	1	4	2	1		2	1			1										
Italy (Rome and vicinity)	C		1																		
Jamaica (outside Kingston) (alastrim)	C	6	9	9	7	1		1	1		2				4		1	1	3		
Kingston	C		3	2																	
Japan:																					
Nagasaki	C	2																			
	D	1																			
Tokyo	C													2	1		1				
	D														1						
Mexico:																					
Acapulco	C		2		1																
	D		2		1																
Chihuahua	D											1									
Guadalajara	D					1			1											1	

Manzanillo	D												1								
Mexico City and surrounding territory	C					1	1	1	1							1	1	2	P		
Monterey	C																				
	D																				
San Luis Potosi	D	1																			
Tampico	C																		1		
Torreon	D	1		2																	
Palestine: Jerusalem	C						1								1						
Paraguay	D																				
Persia: Teheran	D																				
Poland	C	2							1	5	1			1		1		1			
	D	1																			
Porto Rico [1]																					
Portugal:																					
Lisbon	C		3	8	4		3	3	4	1	2	4	5	5	2	2		3	3	9	
	D								1												
Oporto	C		1																		
Senegal: Dakar	C																		8		
Siam	C	31	27	6	1		8		1	2	5	8	8	13	7	5					
	D	10	15						1			2		1	1	2					
Bangkok	C		3		1		1				1	2									
	D		1									1									
Spain																					
Malaga	D				1	1															
Seville	C												1								
Valencia	C			1							1	1									
Straits Settlements: Singapore	C				1													1			
Switzerland	C									2											
Tunisia: Tunis	C										2	2			3			2			
Union of South Africa:																					
Cape Province	C	P		P										P							
Orange Free State	C	P			P	P	P	P	P	P				P							
Transvaal	C			P	7																
Venezuela: Maracaibo	D		2	1														1			

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928	
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20
Algeria	C	376	450	382	682											
Oran	C	14	10	16	11											
Indo-China	C	19	3	21	25	13	3	22	10	4	20		40	18		
Syria:																
Aleppo	C										1		1			
Beirut	C								1		1			15	11	26
Damascus	C		3	5	22		13		4	6	2	11	2			

[1] An epidemic of smallpox near Fajardo, P. R., was unofficially reported Mar. 12, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July	August	September	October	November	December	January
Angola	C	42	2	5	73	71		
	D				2			
Congo	C			5	77			
Cuanza-Norte	C			1				
Cuanza-Sul	C				2			
Loanda	C			1				
Zaire	C			3	4	1		
Brazil: Porto Alegre	C	5	3	3	4	1		
British East Africa: Zanzibar	C				2			
	D				1			
Chosen	C	19	2		2	2		
	D	6				1		
Ecuador, Guayaquil	C		2	2	1	1	4	2
France	C	23	6	8	7	4	14	11
Gold Coast	C	1	1	5	4			
Greece	C	3	3	4	4		5	6
Latvia	C				2			
Mexico	D	93	73	55				
Morocco	C	53	76	51	81	140	401	55
Nigeria	C	492	91	237	223	93		
	D	83	20	70	51	30		
Persia	D					2		
Spain: Madrid	D					1		
U. S. S. R.:								
Railways, etc.	C	11	6	9	7	11		
Other territories in Europe	C	146	111	109	220			
Transcaucasus, Siberia, and Central Asia	C	36	29	15	40	21		
Ukraine	C	16	4	7	11	20		

TYPHUS FEVER

Place		July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	Mar. 3, 1928
Algeria:																				
Algiers	C																			
Oran	C														1					
Austria: Vienna	C									1	1	1	1		2			2		6
Bulgaria: Sofia	C			17	6				1	1	4	1		1		1				
	D				1															
Chile:																				
Antofagasta	D			1																
Valparaiso	C		1		1	1	1						1							
	D	2	1		2															

China:																				
Manchuria—Harbin	C	2			1															
Tientsin	C		2																	
Egypt	C	2		12	4	1	7	3	3	1							1			
	D	3		5			5	1	2											
Cairo	C							1	1											
	D							1												
Port Said	C			1			1													
Ireland (Irish Free State):																				
Cork County	C							3				1								
Donegal County, Letterkenny	C			4																
Mexico:																				
Guadalajara	D					1														
Mexico City, including municipalities in Federal District	C	17	19	18	28	7	6	4		4	4	4	3	2	1		2	1		
	D				2				1	1	3	1								
Morocco	C											107	235	257	214	370	210			
Palestine	C	11	1	5	3	5	1	2	1				8		2	2	1	1		
Poland	C	50	35	19	64	15	28	17	45	26	43	68	68	101	92	87	66			
	D	6	2	4	11	1	1		4	1	3	6	6	4	3	5	7			
Portugal: Oporto	C	1			1												1			
Rumania	C	36	16	17	22	6	8	8	13	32	17	19								
	D	1		2							2	1								
Syria, Aleppo	C		2									2								
Tunisia	C	14	1	3	1				1	1			5	4				1		
Union of South Africa																				
Cape Province	C	P	P	P	P	P	P	P	P	P	1	P		P	P	1				
Natal	C	P	P	P	P	P	P	1	1	2	P	P	1		P					
Orange Free State	C			P				P								P				
Transvaal	C	1		5	P	P	P									P				

Place		1927 July	August	September	October	November, 1927 1-10	11-20	21-30	December, 1927 1-10	11-20	21-31	Jan. 1-10, 1928
Algeria	C	67	33	10	12							
	D	13			1							
Algiers	C	2	2	6	2							
Bulgaria	C	12	24	7	2						2	7
	D		1	2	1						1	
Morocco	C	148	76	7	11	5	14	7	5	6	75	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		July	August	September	October	November	December	January
Argentina	C					1		
	D						1	
China: Shanghai	D					1		
Chosen	C	72	17	1	16	26	38	
	D	8			1	2	3	
Chemulpo	C	1	2					1
Gensan	C	2						1
Seoul	C	2	3		2			
	D	1			1			
Czechoslovakia	C	6		6	1		6	
Greece: Athens	C	1		2			1	2
Japan	C	1						
Latvia	C	6						
Lithuania	C	44	18	7	9	18	27	86
	D	5	8	1	1	1	1	10
Mexico	D	12	38	14	36	29		
Peru:								
Arequipa	D		2	1	2		1	2
Lima	D	8						
U. S. S. R.:								
Railways, etc.	C	30	22	25	23	33		
Transcaucasus, Siberia, and Central Asia	C	79	69	60	61	49		
Ukraine	C	96	85	114	151	198		
Other territories in Europe	C	732	552	555	521			
Yugoslavia	C	11	9		1	1		7
	D	4	1					3

YELLOW FEVER

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 29-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927 5	12	19	26	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	Feb. 4, 1928
Ashanti: Obuasi	C		1																	
	D		1																	
Belgian Congo:																				
Boma	C														3					
	D														2					
Matadi	C														6	12	11	1	5	8
	D														2	6	8	2	5	6

Dahomey:																				
Grand Popo	C									1										
	D									1										
Porto Novo	C	1																		
	D	1																		
Ivory Coast	C	1												1						
	D	1												1						
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	9	16	6	6	7										
	D	3	9	21	31	8	10	4	4	6										
Dakar	C	1			12	3	6		5	2	1	4			1	1				
	D				7	2	4		4	2	1	4			1	1				
Togoland	C		1																	
	D		1																	

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

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SPECIAL ARTICLES

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg. Gen R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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MENINGOCOCCUS MENINGITIS IN THE UNITED STATES, 1928

During the first 12 weeks of 1928, more cases of meningococcus meningitis were reported in the United States than were reported during the corresponding period of 1926 or 1927. However, the total number of cases is small in proportion to the population, and some of the increase may be accounted for by better reporting, resulting in the recording of a larger percentage of the cases which occurred in 1928 than was recorded for the other years.

The figures for 42 States, having a population of about 105,000,000, are as follows:

Cases of meningococcus meningitis reported by 42 States, January 1 to March 24, 1928, inclusive, and corresponding periods of 1926 and 1927

	Cases
1926	562
1927	698
1928	1, 179

The highest prevalence is reported from the Mountain States and the lowest case rates are in the South Atlantic States.

The following table shows the distribution of the cases and the case rates in different sections of the country.

Cases of meningococcus meningitis reported during the first 12 weeks of 1928, with annual rates per 100,000 population, by geographical divisions

	Number of cases	Rate per 100,000
New England (5 States)	40	2. 23
Middle Atlantic (3 States)	229	3. 96
East North Central (4 States)	203	4. 88
West North Central (7 States)	153	5. 03
South Atlantic (6 States and District of Columbia)	35	1. 30
East South Central (3 States)	35	2. 22
West South Central (4 States)	59	2. 18
Mountain (7 States)	282	32. 06
Pacific (3 States)	143	8. 84
Total (42 States and District of Columbia)	1, 179	4. 86

ALCOHOLISM AND DRUG ADDICTION AS SEEN IN UNITED STATES MARINE HOSPITALS

By H. McG. Robertson, *Surgeon, United States Public Health Service*

This brief report was intended, primarily, to cover this subject as personally known to the writer at the United States Marine Hospital in Chelsea (Boston), Mass., for the period July 1, 1924, to June 30, 1927. However, as figures covering all hospital operation of the Public Health Service for the three fiscal years were easily available, it is deemed advisable to set forth all the data in a report separate from the annual reports of the service. In giving the figures bearing on these two causes for hospitalization, no comparison is made with former years, neither before nor after the eighteenth amendment went into effect, nor before more stringent efforts were made to curb the narcotic evil. Neither is any comparison attempted with figures from other hospitals during the same period. It is believed that anyone interested may easily make these comparisons.

In regard to the types of patients treated by the Public Health Service in its marine hospitals and in its many contract hospitals, it may be said that they are practically all adult males, usually between the ages of 18 and 50 years. No children of either sex are admitted, and women constitute much less than 1 per cent of all patients. In the service at large approximately 65 per cent of the persons hospitalized are from American merchant vessels; about 12.5 per cent are from the Coast Guard, while the remainder are from the Veterans' Bureau, United States Employees' Compensation Commission, and other Government services whose personnel are legally entitled to treatment by the Public Health Service. American merchant vessels and the Coast Guard furnish, it is seen, about 77.5 per cent of the patients. It is probably correct to say that 2.5 per cent of these represent officers of the two services, while the remaining 75 per cent—or three-fourths of all patients treated—are from the crews of merchant vessels and from the enlisted personnel of the Coast Guard. These men are usually employed at a reasonable wage and may be assumed to possess some money, for a time at least, after reaching port. It may be mentioned that it is with this personnel that tradition has long associated "hard drinking" and other forms of debauchery. Here again no comparison is attempted with other types of workers, but the figures seem to speak well for the "seamen."

In regard to the patients of the Marine Hospital in Chelsea (Boston), Mass., it may be said that there is a somewhat larger number of Coast Guard patients, the percentage there being at least 15, and seamen not less than 65 per cent. Incidentally, the opportunities for obtaining alcoholic drinks about the Chelsea water front are

probably not excelled at this time in any of our ports. The large foreign population has made difficult the enforcement of laws dealing with the manufacture and sale of alcohol.

TABLE 1.—*Alcoholism and drug addiction, United States Marine Hospital, Boston (Chelsea), Mass., July 1, 1924, to June 30, 1927*

Fiscal year	Patients treated (all causes)	Deaths (total)	Patients treated for alcoholism, acute and chronic	Deaths from alcoholism	Cases of drug addiction
1925	1,464	40	7	0	0
1926	1,567	38	5	1	0
1927	1,759	44	5	0	0
Total	4,790	122	17	1	0

Of the 17 alcholic patients treated at this hospital during the three years under consideration, all but two were men in their forties, most of them old alcoholics who were in for acute "exacerbations." The period of treatment was usually very short, seldom more than three or four days. There was no case of delirium tremens admitted to the hospital during this period, nor did such a case develop in any patient after admission. There were no cases of Korsakow's psychosis or acute alcoholic hallucinosis among the several psychotic patients sent for observation from the Marine Hospital to the Boston Psychopathic Hospital during the period under consideration. No patient was under treatment in this period for alcoholic multiple neuritis.

In the Marine Hospital at Chelsea there was, during these three years, one death attributed to cirrhosis of the liver. This patient had been a user of alcohol, but was also a syphilitic. It was the belief of the staff that the latter factor was the predominating one in this case. Of the two alcoholic patients under 40 years of age, one was the man who died in 1926. There was little to connect this case with alcohol. The immediate cause of death was complete suppression of urine, and the death certificate was given by the medical examiner to whom the case was referred because of a somewhat doubtful alcoholic connection.

No patient was treated for drug addiction in the Chelsea (Boston) Marine Hospital between July 1, 1924, and June 30, 1927. No such patient applied for admission. Further, it may be said that there was nothing which led to the belief that any patients treated during this period were using drugs or had used such in the past. No unusual desire for narcotics was noted in any postoperative case during this time.

TABLE 2.—*Alcoholism and drug addiction—Total for all marine hospitals for period July 1, 1924, to June 30, 1927*

Fiscal year	Patients discharged	Deaths (total)	Alcoholism, acute and chronic	Deaths from alcoholism	Cases of drug addiction
1925	31,908	879	240	1	30
1926	33,275	872	225	5	17
1927	33,531	901	283	1	8
Total	98,714	2,652	748	7	55

A comment that may be made on the above table is that the figures are based on "discharges" rather than "patients treated," as was the case in the table for the Chelsea marine hospital. This was necessary because of the method of preparing tables for the annual reports of the Public Health Service, but it is of no consequence.

In all marine and contract hospitals of the Public Health Service during the three-year period under consideration there were nine deaths reported as due to cirrhosis of the liver.

There are 25 marine hospitals operated by the service on the Atlantic, Pacific, Gulf, Great Lakes, and rivers of the United States. There are 125 contract hospitals—second, third, and fourth class stations—in the United States, Alaska, Hawaii, the Philippines, Porto Rico, Virgin Islands, and Canal Zone, where patients of the service are treated. These 150 hospital stations treated or discharged 748 patients in a period of three years who were victims of acute or chronic alcoholism.

The percentage of such patients varies slightly. For 1925 it is three-fourths of 1 per cent, for 1926 this dropped to two-thirds of 1 per cent, while for 1927 the percentage rose to a little more than four-fifths of 1 per cent.

The decline in cases of drug addiction—about 50 per cent for each year—is interesting, though no explanation is attempted.

Personal experience in the Marine Hospital in Chelsea leads to the remark that alcoholism and drug addiction present no problem of consequence there. Apparently the same is true for the other hospitals of the United States Public Health Service.

NATIONAL LEPER HOME (UNITED STATES MARINE HOSPITAL), CARVILLE, LA.

Review of the More Important Activities During the Fiscal Year Ended June 30, 1927

By O. E. DENNEY, *Surgeon (R), United States Public Health Service, Medical Officer in Charge*

The 12-month period here reported on has been especially satisfactory in that an increasing number of patients have shown gratifying progress toward permanent arrestment of leprosy. It is difficult, however, to measure this improvement in general health and morale,

and equally difficult to point to any one treatment or condition as being responsible.

During the year, 56 patients were admitted; 40 absconded; 12 absconders were readmitted; 2 patients were discharged on parole, leprosy arrested and as no longer a menace to public health; 1 leper was deported and several additional cases are receiving consideration by the Bureau of Immigration pending deportation; 103,337 hospital days of relief were furnished; and 17 deaths occurred, giving a mortality rate of 60 per thousand. The causes of death were as follows:

Mortality by cause

Arteriosclerosis, coronary	2	Pneumonia, bronchial, nephritis, acute parenchymatous	2
Cardiac asthma	1	Pneumonia, hypostatic	1
Enterocolitis (*Ameba histolitica*)	1	Pneumonia, lobar	3
Leprosy, mixed	1	Pneumonia, lobular, hypostatic	1
Leprosy, nodular	1	Tuberculosis, pulmonary	1
Nephritis, acute parenchymatous	3		

Tabulation of nativity of patients in the hospital

Alabama	1	Bermuda	2
Arkansas	1	Bohemia	1
California	9	British Guiana	3
Florida	17	Canada	1
Georgia	3	Cape Verde Islands	1
Hawaii Territory	7	Central America	1
Kentucky	1	China	18
Louisiana	90	Dutch Guiana	1
Maryland	1	Finland	2
Minnesota	1	Germany	2
Mississippi	4	Greece	12
New Jersey	1	Hungary	1
New York	3	India	2
North Carolina	2	Ireland	1
Oklahoma	1	Italy	7
Pennsylvania	1	Mexico	12
Philippine Islands	5	Palestine	3
Porto Rico	2	Panama	1
Rhode Island	1	Portugal	1
South Carolina	1	Russia	2
Tennessee	1	Spain	5
Texas	17	Sweden	1
Virginia	1	West Indies	4
Virgin Islands	1		257
Bahama Islands	1		

Admission of patients by States

California	6	North Dakota	1
District of Columbia	1	Ohio	1
Florida	3	Oregon	1
Illinois	1	Pennsylvania	1
Louisiana	24	Tennessee	1
Montana	1	Texas	9
New York	4	Washington	1
North Carolina	1		56

The hospital, as in the past, has been available for undergraduate and postgraduate instruction in leprosy. Ninety-three medical students, 110 physicians, and 32 nurses visited the hospital during the year. The Sixth Louisiana District Medical Society convened in the hospital for its annual session, and 92 physicians attended the meeting, which was devoted exlusively to the subject of leprosy. A demonstration of cases and a visit through the hospital followed the meeting.

Medical service.—During the year 191 patients were admitted to the infirmary from their regular quarters for the treatment of acute or chronic manifestations of leprosy. Twelve males and 8 females remained in the infirmary throughout the entire 12 months, while the remainder, after longer or shorter periods, returned to their regular quarters in the cottages, or died

Infirmary facilities are not completely satisfactory in that it has been necessary, in the absence of an infirmary building, to use cottages, with some remodeling, to furnish facilities for bed cases. The available bed space in the infirmary is always occupied. It has been necessary a number of times to place two beds in single rooms in order to accommodate lepers suffering from acute exacerbations of leprous symptoms. It should be noted that each patient in the institution has his private room in a cottage, which he retains during his temporary stay in the infirmary.

Plans have been drawn up and approved for the erection of a two-story, 100-bed infirmary building, in which can be satisfactorily housed the various important activities pertaining to patients acutely ill, simplifying the administration of the institution and rendering more efficient and economical the care of the patients. Congressional appropriation is necessary for the completion of this proposed infirmary building.

Of the 255 patients in the hospital, 154 are taking crude chaulmoogra oil by mouth, the dosage ranging from 3 drops to 400 drops daily, according to the tolerance of the individual. Twenty-eight patients have been placed on intramuscular injections of crude chaulmoogra oil, the oil, with an analgesic, being administered twice weekly in doses ranging from 3 to 8 c. c. This experiment, which will be reported in detail elsewhere, offers an opportunity to saturate the patient with chaulmoogra oil in what has so far proved to be a relatively painless manner. Previously reported chaulmoogra oil injections in this hospital and elsewhere have, of necessity, taken into consideration the considerable amount of pain from the injection of the preparations of chaulmoogra oil and its derivatives.

In the out-patient clinic, for the care of nonleprous Government employees and personnel, 381 patients were given emergency or routine treatment.

Surgical service.—During the year 70 surgical operations were performed, all of a relatively minor nature, extending in severity from the excision of ingrowing toenails to the excision of tumors. No deaths resulted from surgical procedures during the year. A total of approximately 75,000 surgical dressings were performed in the clinic for ambulatory lepers, under the supervision of the surgical staff. Fifty lepers are receiving experimental intravenous therapy, consisting largely of neosalvarsan, tryparsamide, and mercurochrome.

Recently, a group of advanced lepers was selected for experimental treatment by the intravenous injection of basic fuchsin, in increasing doses, with somewhat encouraging results to date.

Investigation in therapeutics.—Treatment has been continued with the ethyl esters of chaulmoogra oil augmented by the oral administration of the crude oil in specially formalized capsules. These latter seem to be resistant to the gastric juice; and the oil liberated in the intestines (and not in the stomach), does not provoke the same nausea and vomiting as when given in ordinary capsules.

A foreign protein is being used in two cases, in the hope that the reaction provoked may lead to improvement. The protein, an albumose (Hirudin), was selected because of its being a venom and also on account of its property of preventing the coagulation of blood. Reactions, febrile and cutaneous as well as local, have followed its use. Some clinical improvement has been noted in both cases, though neither has shown appreciable diminution in acid-fast organisms in lesions.

Special treatments.—It has been gratifying to note considerable improvement in contraction deformities of the hands and feet of those cases attending the clinic regularly for physiotherapy treatment. Ulcers have responded almost invariably with beneficial results from ultra-violet ray treatment. In many cases bone necroses have been arrested. Nerve pains have been relieved with the ultra-violet ray treatment and diathermy.

It has been interesting to note that nerve pains have responded more quickly to the ultra-violet radiations as secured from the carbon arc burner than to those from the quartz mercury burner. This may be due to the greater amount of heat given off by the carbon arc burner. Space in the physiotherapy and orthopedic department has become congested, due to the increase in number of patients applying for treatment and the additional necessary apparatus. Some of the patients have been relieved of their deformities, and sensation in many nerve cases has returned. Operations have resulted satisfactorily in all cases submitting to or applying for orthopedic operations. A total of 38,953 physiotherapy treatments were given during the year.

Neuropsychiatric service.—During the fiscal year 41 new patients and 56 old patients were examined in the neuropsychiatric section. Mental manifestations were noticed in 21 cases. All cases examined were of the mixed type of leprosy, but 24 showed marked neurological manifestations. Of the cases examined neurologically before being discharged on parole, none was found with active nervous symptoms. One patient passed through the episode of manic depressive psychosis which ran its course in about five months. To all appearances this patient is now normal. One patient showing hallucinations of sensation has markedly improved. One case presenting terminal dementia (praecox) died.

A paper on the mental aspects of leprosy was presented before the neurologic section of the American Medical Association at its annual session in Washington, D. C.

Ophthalmologic service.—The ophthalmologic problem for the past year has been the treatment of iridocyclitis; because its ultimate results if untreated, and often if treated, are lenticular and vitreous opacities and occlusion of the pupil. It is believed that mercury cyanide injected subconjunctivally has done some good.

Routine prophylaxis and treatment have been rendered to the group of patients who suffer considerably from both the acute and chronic ocular disorders.

Dental service.—Dental treatment has continued, directed largely toward the removal or prevention of pyorrhea, with routine treatment of leprous oral ulcers, diseased root canals, crown and bridge work, fillings, denture constructions, and prophylaxis.

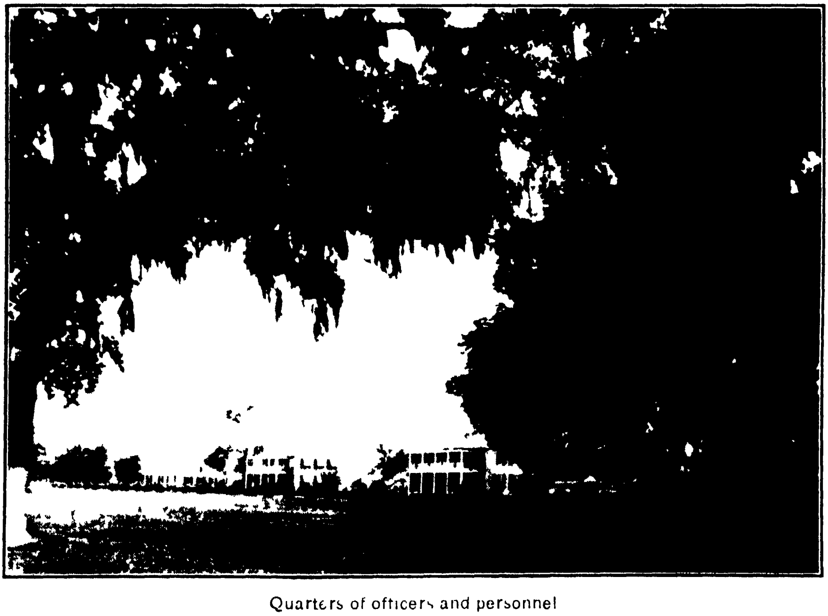
Clinical laboratory.—The observation of certain clinical phenomena coincident with the vaccination of lepers with smallpox virus followed by more or less improvement in the patient (noted by Hopkins and Denney)[1] prompted the revaccination of lepers to determine the possibility of continuing this clinical improvement, presumably stimulated by vaccinia.

A single patient was first periodically vaccinated by subcutaneous and intramuscular injections of increasing doses of smallpox vaccine. The results were sufficiently encouraging to justify additional experimentation. At present 25 lepers with different clinical manifestations are receiving periodic subcutaneous or intramuscular injections of smallpox virus. A detailed report will be submitted at the appropriate time.

The knowledge that carbon-dioxide snow and some forms of cautery are useful in removing certain lesions of leprosy prompted one of the members of the staff to experiment with metallic applicators, heated to various temperatures by a current of water passing through the interior of the applicator. After experimentation a satisfactory de-

[1] Pub. Health Reports, vol. 37. No. 51 (Dec. 22, 1922), pp. 3141-3149. Reprint No. 805.

Administration building at the National Leper Home



Quarters of officers and personnel

View of campus showing some of the patients' cottages

Tennis court

vice was obtained whereby the surface of an applicator is maintained at a controllable temperature, and gratifying results have been obtained in removing superficial leprous lesions. (Detailed report to be submitted.)

Experiments have continued in the isolation of acid-fast bacilli from lepers with the hope that some additional light might be shed upon the life history of the organism, which as yet does not appear to have been cultivated by routine methods.

A total of 7,868 routine examinations and cultures have been made in the laboratory by one full-time physician assisted by two patients who have been trained as technicians.

Clinical photography as a record of progress of individual patients has continued as a routine procedure. The majority of the photographs are in black and white, but a large number of records have been made by photographing leprous lesions in natural colors. The collection of photographic records is already very valuable and will become increasingly so.

Leprosy does not respect race, creed, or social status. A leprosarium hospitalizing patients from a large country cares for a cosmopolitan group seldom encountered in a general hospital. The manifold manifestations of leprosy, with the diversity of symptoms and the variety of psychologic responses coupled with the conscious or unconscious pessimism of the average human being suffering from a chronic progressive disease, confronts the administrative officers with the difficult problem of maintaining a proper morale.

Recognizing the great importance of occupation to prevent morbid introspection, vocational training has been introduced among the patients, in order that those physically and mentally able might be employed, to the profit of both the patient and the hospital.

In the current year, on the average, 81 lepers have been employed under the general designation "attendants." Many of this number gave daily and satisfactory service in their assigned work. The work performed by these employees is of a necessary nature requiring some skill and concentration, and ranges in variety from the more simple duties of housekeeping and bedside care of fellow patients to the more exacting work as assistants in the general laboratory, physiotherapy department, dental laboratory, and operating rooms. The compensation paid to the patients ranges from $15 to $45 a month per attendant. The work performed in many instances is equal in character to that to be expected from nonleprous employees, and the salary paid is probably half that which would be necessary to obtain nonleprous employees. Vocational training, therefore, furnishes daily routine occupation to one-third of the total population of the hospital and to almost all of those physically fit for such an undertaking.

The patients' library has continued its function of serving as a connecting link between the patients and the public. Yearly an increasing number of patients avail themselves of the books, magazines, and newspapers which are loaned under conditions similar to those existing in cities.

The technical library of the medical officer in charge is of great value to the hospital staff for direct study and for reference. The total number of volumes to date is 634. All the more important medical journals are subscribed for annually and bound.

A small golf course has been started on the patients' campus and a surprisingly large number of enthusiastic players has developed. A concrete tennis court was also constructed for the patients.

Routine maintenance and repairs of buildings and equipment have continued under the carpenters, plumbers, electricians, and painters. A repainting of all buildings on the reservation was begun in the latter part of the year, to continue until completion of the project.

Farming on a large scale was not so profitable as in previous years, due largely to flooding of crops by excessive rainfall and imperfect drainage, the rains being reinforced by excessive seepage from the Mississippi River during its flood season—a combination of conditions probably not to be encountered again for several years. The project, however, represents a credit balance of approximately $1,200.

The completion of the dairy barn has enabled the station to maintain a model dairy consisting of 74 milk cows. In addition, 68 beef cattle have been received from the United States Marine Hospital at Fort Stanton, N. Mex., and fattened preparatory to slaughtering. The dairy herd, consisting of 20 Jerseys and 54 Holsteins of good stock, produced 47,277 gallons of excellent milk having a total market value of $19,856.34. The entire herd has been repeatedly registered as nontuberculous.

With materials furnished by the supervising architect and with station labor, a reinforced concrete three-room isolation building has been constructed for the segregation of dangerously insane or other patients whose liberty might endanger themselves or their fellow patients.

A fire-resisting garage has also been constructed by station labor, of size sufficient to house 15 trucks and 3 cars. A large workshop with galvanized-iron walls and doors is a part of the building.

The administration building is being enlarged by adding an additional kitchen and dining-room facilities on the first floor, for the personnel, and an additional dormitory and infirmary space on the second floor.

An artesian well was drilled immediately adjoining the power house in order to obtain cool water for the ammonia condensers of the ice plant. A flowing well was obtained, delivering water without

pressure. The amount was increased by the installation of an air lift. The water delivered to the condensers is at a temperature of 68° F., as compared with the summer reservoir temperature of from 80° to 96° F. The water contains a large amount of iron and sulphur and therefore is not suitable for general use upon the station.

During the year changes were made in the method of water clarification and purification by the discontinuance of alum precipitation and the substitution of iron and lime. The chemicals are let into the water intake by mechanical feeders and mixed by passing rapidly by baffles before sedimentation. A crystal-clear water, bacteriologically satisfactory, is obtained after final filtration through three sand-gravel filters.

In the spring of 1927 a gradual rise of the Mississippi River, upon which this hospital faces, forboded considerable damage to the surrounding country, and it was necessary, for a period of approximately six weeks, for the hospital to assume its share of the neighborhood's work in maintaining the levees in a safe condition. The hospital, by agreement, was assigned the responsibility of maintaining nearly 3 miles of levee, and the day laborers, carpenters, painters, and even members of the technical staff, cheerfully cooperated with the levee officials.

Routine work on the station was, of necessity, almost abandoned beyond the necessary care of patients and sanitation, with coincident setback to the general maintenance of the reservation. As the river subsided, routine work was resumed and the grounds are rapidly being returned to their normally neat and orderly appearance.

KEY-CATALOGUE OF INSECTS OF IMPORTANCE IN PUBLIC HEALTH

The United States Public Health Service has just issued Hygienic Laboratory Bulletin No. 150, entitled "Key-Catalogue of Insects of Importance in Public Health." This represents the fourth catalogue in this series of key-catalogues on medical zoology issued by the Public Health Service.

The work has been prepared by Prof. C. W. Stiles of the United States Public Health Service, and Dr. Albert Hassall of the United States Bureau of Animal Industry, on the basis of their personal observations combined with thousands of references to the literature indexed in the Government card catalogue.

Ordinarily, insects in their relation to health and disease are viewed chiefly from the standpoint of being either external parasites, such as lice and fleas, or transmitters of disease, such as mosquitoes in the case of malaria and fleas in the case of bubonic plague. The present

publication carries the subject much more into detail. In the body of the bulletin numerous insects are arranged systematically according to their more or less generally adopted classification, with notation as to their public health importance and their geographic distribution. In the introduction, the different genera of insects are cross referenced to the following subjects:

A, biting insects; *B*, on cadavers or in graves; *C*, control of public-health pests; *D*, dermatology (lesions, dermatitis, eruptions, exanthema, parasites, urticaria); *E*, edible (food, drink); *F*, excreta; *G*, food and drink; *H*, jurisprudence; *I*, laity (fear, superstition); *J*, parasites and pseudoparasites (abdomen, ear, external, eye , head, intestine, miscellaneous, mouth, nose, stomach, subcutaneous, throat, urinary system); *K*, pests (books, clothes, drugs, records, miscellaneous); *L*, pinching insects; *M*, poisons (arrows, defensive, food, spines, miscellaneous); *N*, pollution (air, water); *O*, stinging insects; *P*, therapeutics (lay, professional); *Q*, vectors (aspergillus, bacteria, filth, Protozoa, Trematoda, Cestoda, Nematoda, Acanthocephala, Insecta).

The publication is of special interest to public health officers, physicians, zoologists, lawyers, and students of medicine and zoology, and forms a condensed summary of the entire field of public health entomology.

For instance, if a public health officer wishes to know what particular insects are known to transmit or are suspected of transmitting a given infectious disease, he refers to the name of this disease in the introduction and then follows the subject as cross referenced to the body of the work. If a dermatologist wishes to locate the various caterpillars which cause the condition known as urticaria, he looks up the word "urticaria" in the introduction under Dermatology, and finds cross references to 40 different genera of moths and butterflies, the larval stages of which cause urticaria in man. If a lawyer desires to find a list of the insects of importance in zoological jurisprudence, as, for instance, in connection with the Law of Nuisances, or in connection with the French theory of determining how long a human body has been dead, he looks for the word "jurisprudence" in the introduction and finds the subject cross referenced to the body of the work. In connection with the application of entomology to legal cases involving possible homicide, the authors of this bulletin take a very conservative position toward the French theory; in fact, they state that it is of very limited, if any, practical application.

Copies of this bulletin may be obtained upon request from the Surgeon General, United States Public Health Service, Washington, D. C.

UNDULANT FEVER IN NEW YORK STATE

The following item relative to the occurrence of undulant (Malta) fever and the prevalence of contagious abortion in cattle in New York State was taken from the Health News for March 26, 1928, published by the New York State Department of Health:

From January 1, 1926, to date there have come to the attention of this department 24 cases of undulant fever. Four additional reported cases are considered somewhat doubtful because of inadequate history or absence of laboratory confirmation.

Of the 24 cases one was an infection by *B.* [*Br.*] *melitensis* acquired in the State laboratory and without doubt was a true case of Malta fever. The others were probably all caused by *B.* [*Br.*] *abortus*, as agglutination of that organism occurred with a higher dilution of the patient's serum than *B.* [*Br.*] *melitensis*.

There was one definite outbreak of undulant fever in Newark, Wayne County, although only three persons were affected. The patients were of different families but all were using grade A raw milk from the same farm on which five cows had aborted. It was found at the State Agricultural College at Cornell that the blood serum from these cows agglutinated *B.* [*Br.*] *abortus* in high dilution.

In addition to this small outbreak there have been two cases reported from each of the following cities: Jamestown, Ithaca, Hudson, and Utica, with an additional case from just outside the last-named community. These were all solitary cases, as were the remainder of the reported cases which were widely spread over the State.

With the exception of the Newark, N. Y., outbreak the epidemiological evidence is not very conclusive of the relationship of milk to the means of transmission. On the other hand, it is stated that contagious abortion is very prevalent in New York State, 30 per cent of the herds being estimated as affected.

DEATHS FROM AUTOMOBILE ACCIDENTS IN LARGE CITIES, FEBRUARY 28, 1926, TO FEBRUARY 25, 1928

The Department of Commerce announces that during the four weeks ended February 25, 1928, automobile accidents were responsible for 510 deaths in 77 large cities of the United States, as compared with 441 deaths during the four weeks ended February 26, 1927. Most of these deaths were the result of accidents which occurred within the corporate limits of the city, although some accidents occurred outside of the city limits.

For comparison, the number of deaths due to automobile accidents within city limits is desirable. Such figures are available for 75 cities for the four-week period ended February 25, 1928, and for the corresponding four-week period of 1927, the figure for 1928 being 448, as contrasted with 384 for the corresponding four weeks in 1927.

The numbers of automobile fatalities by four-week periods since May, 1925, for 77 cities, regardless of place of accident, are given below. The lowest total (346) appears for the four-week period

ended March 27, 1926, and the highest (686) for the four-week period ended November 5, 1927. The numbers in the 37 periods of four weeks were as follows:

Four weeks ended—

February 25, 1928	510	February 26, 1927	441	February 27, 1926	374
January 28, 1928	528	January 29, 1927	470	January 30, 1926	428
December 31, 1927	623	January 1, 1927	522	January 2, 1926	550
December 3, 1927	618	December 4, 1926	632	December 5, 1925	623
November 5, 1927	686	November 6, 1926	676	November 7, 1925	612
October 8, 1927	662	October 9, 1926	650	October 10, 1925	527
September 10, 1927	526	September 11, 1926	558	September 12, 1925	521
August 13, 1927	506	August 14, 1926	499	August 15, 1925	467
July 16, 1927	573	July 17, 1926	482	July 18, 1925	493
June 18, 1927	504	June 10, 1926	547	June 20, 1925	492
May 21, 1927	529	May 22, 1926	493	May 23, 1925	421
April 23, 1927	491	April 24, 1926	423		
March 26, 1927	439	March 27, 1926	346		

For the 52-week periods ended February 25, 1928, and February 26, 1927, the totals for the 77 cities were, respectively, 7,196 and 6,740, which indicate a rate for the latest period of 22.4 per 100,000 population, as against an earlier rate of 21.3, or an increase of 5 per cent in the rate in a single year.

Ten cities reported no deaths from automobile accidents for the last four weeks, while eleven cities reported no deaths from automobile accidents for the corresponding period of 1927.

For the last four-week period reports as to whether deaths occurred from automobile accidents within city limits or outside were received from all of the 77 cities reporting. In these cities, the total number of deaths from automobile accidents in this four-week period was 510, but only 450 of these were due to accidents within city limits.

COURT DECISION RELATING TO PUBLIC HEALTH

Ordinance requiring milk sold for consumption on premises to be in original container held valid.—(Wisconsin Supreme Court; City of Milwaukee *v.* Childs Co., 217 N. W. 703; decided February 7, 1928.) An ordinance of the city of Milwaukee provided:

It shall be unlawful, for any person, within the limits of the city of Milwaukee, to sell milk in any way whatsoever for consumption on the premises where sold, excepting in original containers well capped or sealed, served intact in such container or opened in the presence of the person served, and containing only the quantity of milk intended for use of the person served, and all milk so served shall, in every instance, be bottled either at a dairy or milk plant.

The defendant was convicted of serving milk to a patron of its restaurant in violation of the terms of the ordinance. On appeal the power of the city to adopt the ordinance was challenged and the ordinance itself was attacked as being invalid, but the supreme court affirmed the conviction. The following are portions of the appellate court's opinion:

The ordinance, if reasonable, is well within the power of the city to enact. Properly construed, the ordinance is a reasonable regulation. The language of the ordinance would authorize a very sweeping construction—a construction which would make it impossible to serve any article of food of which milk was the dominant element, such as milk toast, an oyster stew, or milk to be used in tea or coffee, or upon pudding or fruits or breakfast foods. To give the ordinance such a construction would make the reasonableness thereof very doubtful, and we are disposed to construe it as prohibiting merely the sale of milk for beverage purposes except as therein prescribed. As so construed, the regulation is not unreasonable.

It is a matter of common knowledge that milk is a prolific source of disease and that it is easily contaminated. Every regulation relating to the handling of milk which minimizes the opportunity for contamination is promotive of the health of the community. The regulation provided by the ordinance in question certainly has that effect. * * *

The contention that the ordinance denies due process of law and deprives defendant of property without compensation is not of sufficient substance to require discussion. The police power of the State with reference to such matters is too well settled to justify extended treatment here. [Cases cited.]

Neither is there any room for the claim that the ordinance was not violated as a matter of fact. The evidence shows that the milk served was dipped from a larger container in the kitchen and carried to the patron. It may be that the defendant handled the milk served in its restaurant in a highly sanitary manner, but that constitutes no defense. Because milk is customarily handled in a manner which affords opportunity for contamination, the municipality is justified in prescribing regulations for the handling of milk in a manner which shall avoid opportunity for such contamination. Such regulations when so prescribed must be observed by those dealing in milk. The dealer can not justify noncompliance with such regulations by asserting that his method of handling milk was just as sanitary as the regulations prescribed by the municipality. It is possible that, if all dealers handled milk as defendant did, there would be no necessity for the ordinance. But the fact that many dealers do not observe sanitary methods in handling milk makes such regulations necessary or proper. When such regulations are prescribed, they must be observed by all, by the considerate as well as by the inconsiderate dealer.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Bacteriological and Parasitological Study of the Night Soil Disposal in Japan. R. Takano, *Journal Public Health Association of Japan*, vol. 3, No. 12, December, 1927, pp. 1–10. (Abstract by N. R. Stoll.)

This is evidently a continuation of studies earlier published in the same journal in February and March, 1927. Both typhoid bacilli and parasite eggs were examined for longevity under storage conditions in typical night soil jars and a newly devised privy. Using the jars which are typical in the privies of Japanese houses, having a depth of 1.5 feet, a diameter of 1.8 feet, and a capacity of 60 to 100 liters, they were filled with night soil taken from the privy of a representative house. Then a culture of the typhoid bacillus was mixed at the ratio of 1½ mg. per 100 c. c. of night soil, and materials for culture test were then removed on later days from the upper, middle, and lower layers of the contents of the jars. There was a marked correlation with temperature as to the longest intervals during which viable typhoid bacilli were recovered. (Data as to differences at different levels of the night soil are not given.) Thus in fall and winter at Tokyo,

when the maximum temperature in the receptacles was 14° to 19° C., typhoid bacilli were recovered up to 183 days (in 18 experiments a mean of 121 days); in spring, at maximum receptacle temperatures from 19.5° to 24° C., up to 47 days (in 10 experiments a mean of 29 days); in summer, at maximum receptacle temperatures from 25° to 27° C., up to 11 days (in 9 experiments a mean of 8 days).

Experiments in similar receptacles were carried on with *Ascaris* and hookworm eggs. The *Ascaris* perished most speedily in summer, although it takes three months at the shortest. Hookworm eggs do not grow, and they perish by degrees in summer in about one month. These tests were made on the basis of the last occasion when a viable egg could be demonstrated.

The author then tested out the newly devised privy (a modified septic tank arrangement) with five compartments. While typhoid bacilli could always be demonstrated in the first chamber, they decreased markedly in the successive chambers, the fifth chamber being negative except for a very few organisms during the winter. With *Ascaris* and hookworm eggs, the third, fourth and fifth chambers were always negative for viable eggs. The author believes his laboratory tests, together with actual use of the privy, demonstrates the feasibility of the recommended privy for use by farmers who wish to use the night soil from the fifth chamber for fertilizing fields. Chemical tests showed no loss of nitrogen in the fifth chamber contents.

Studies on the Infectivity of Plasmodia of Birds for Mosquitoes, with Special Reference to the Problem of Immunity in the Mosquito. Clay G. Huff. *American Journal of Hygiene*, vol. 7, No. 6 November, 1927, pp. 706-734. (Abstract by A. L. Dopmeyer.)

The contents of this article are as follows: I. Introduction. II. Infectivity and transmission experiments with culicine mosquitoes: (*a*) Historical; (*b*) materials; (*c*) methods; (*d*) results of dissection; (*e*) transmission experiments; (*f*) discussion. III. A study of immunity in the mosquito. IV. Observations upon the biology of mosquitoes. (*a*) Biting habits; (*b*) breeding habits; (*c*) survival under laboratory conditions. V. Observations upon the parasites: (*a*) Prepatent periods; (*b*) sizes of oocysts; (*c*) location of oocysts; (*d*) course of infection with respect to gametocytes; (*e*) figures. VI. Summary. VII. Literature cited.

The summary is as follows: (1) Two species of mosquitoes (*Culex territans* and *salinarius*) are reported for the first time as susceptible to infection with three species of *Plasmodium* of birds (*cathemerium*, *praecox*, and *inconstans*); (2) *Culex pipiens*, previously known as a vector of at least one species of *Plasmodium*, was found to be a vector of two of the three species and susceptible to infection with the other; (3) *Culex quinquefasciatus* and *Aedes aegypti*, previously known as vectors of one species, were found to be susceptible to two of these species of *Plasmodium*. Although no infections of these two species of mosquitoes were obtained with the third species of parasite, it does not seem advisable to conclude that they are nonsusceptible to it until a larger number of feedings have been made; (4) negative results were obtained from infectivity experiments with six species of *Aëdes* and one of *Anopheles* against two of the parasites; and with one species of *Psorophora* against one of the species of parasite; (5) complete transmission of one of the species of parasite was effected with *Culex salinarius;* (6) the length of life of the asexual stages of the parasite in the stomachs of both *Culex pipiens* and *Aëdes sollicitans* was between five and six hours; (7) the digestion of red cells in the stomachs of *C. pipiens* and *A. sollicitans* required about the same amount of time; (8) the asexual stages entirely disappeared from the stomach of *C. pipiens* in six hours, but could be found, though altered in appearance, in *A. sollicitans* in the twentieth hour. Ookinetes first appeared in each species at the end of the twelfth

hour and remained at least 20 hours in *A. sollicitans* and 39 hours in *C. pipiens;* (9) the hypothesis that differences in digestion in *Culex pipiens* and *Aëdes sollicitans* play an important rôle in immunity and susceptibility of mosquitoes is abandoned; (10) evidence indicating an individual immunity within a susceptible species is presented; (11) decided differences in the biting habits of the mosquitoes used were found. In view of preferences shown by *Culex pipiens,* it is believed that this species is the principal vector in nature. Seven species of mosquitoes (representing seven genera) consistently refused to feed from canaries. Marked differences in the reactions of the birds to the bites of the various species were noted; (12) three generations of *Culex pipiens* were reared in captivity; (13) significant differences were found in the length of the prepatent periods of all three species of the parasites; (14) in two typical primary infections in birds the percentage of gametocytes was found to rise continuously from the time of their appearance. The maximum number of gametocytes occurred one or two days after the maximum of total parasites. The percentage of gametocytes in relapse is much lower than in the primary infection. The appearance of symptoms approximately upon the day when the number of gametocytes is at its maximum, is thought to be a factor in the epidemiology of transmission; (15) a study of the distribution of the number of gametocytes over a 24-hour period shows no periodicity similar to that found in the asexual forms.

Studies on Brazilian Mosquitoes. III Genus Culex. Francis Metcalf Root. *American Journal of Hygiene,* vol. 7, No. 5, September, 1927, pp. 574–598. (Abstract by A. L. Dopmeyer.)

This article is the third of a series presenting results obtained during a trip to Brazil in 1925, and consists of a description of various species of *Culex* mosquitoes found, together with a number of plates illustrating the characteristics of these mosquitoes.

The description includes nine species under the subgenus *Culex;* one under the subgenus *Melanoconion;* one under the subgenus *Aëdinus;* seven under the subgenus *Microculex;* twelve under the subgenus *Choeroporpa;* and two under the subgenus *Mochlostyrax.*

Studies on Brazilian Mosquitoes. IV. Notes on Some Brazilian Species of Anopheles. Francis Metcalf Root. *American Journal of Hygiene,* vol. 7, No. 5, September, 1927, pp. 599–605. (Abstract by A. L. Dopmeyer.)

This article is the fourth of a series presenting results obtained during a trip to Brazil in 1925, and consists of descriptions of various species of *Anopheles* mosquitoes found, as follows: (I) The *Myzorhynchella* group; (II) *Anopheles mediopunctatus* Theo; (III) *Anopheles eiseni* Coquillet; (IV) *Anopheles fluminensis* new species.

Several plates are shown illustrating the physical characteristics of the mosquitoes described.

A Comparative Study of the Early Larval Stages of Some Common Flies. Shan Ming Tao. *American Journal of Hygiene,* vol. 7, No. 6, November, 1927, pp. 735–761. (Abstract by A. L. Dopmeyer.)

This article is a report on a detailed study of the early stages of some flies which are common visitors to dwelling places, with keys to some common genera of the families Calliphoridae, Muscidae, Anthomyidae, and Sarcophagidae. Brief descriptions of each species studied are given for the two larval stages.

In his conclusion the author states that he wishes to emphasize the fact that there are distinct generic differences and possibly specific differences between the common carrion and filth flies in their early larval stages.

There is also a bibliography and a number of plates for illustration.

Mosquito-proof Gutterings. F. G. Cawston. *Journal Royal Army Medical Corps*, vol. 49, No. 6, December, 1927, p. 441. (Abstract by Harriet S. Ryan.)

All roof-guttering has been excluded from houses in the Panama Canal Zone and other tropical places after attempts to secure a roof-guttering which will not encourage the breeding of mosquitoes. Cast-iron gutterings could be used to advantage if they were made in molds 5 inches in diameter with a depth of the gutter increasing toward the outlet for the water. The section area should increase as the catchment area and volume of water increase toward the down-pipe. By fixing the upper edge of the guttering on a horizontal plane the required slope is attained; and where a down-pipe is fixed to allow a drop from each end of the roof, a fall of even 2 inches from each end of a 48-foot wall is not too great. Sheet-iron guttering cut out with converging borders, 2 inches wider at one end than at the other end of a 6-foot piece, when bent so that its edges are parallel, gives a slope of 1 inch in every 6 feet. A slope of only 1 inch in 24 feet is considered sufficient for larger buildings.

Sterilization of Milk by Impact of Steam. G. E. Grindrod. (Creamery and Milk Plant Mo., 16 (1927), No. 9, pp. 38, 40, 42, 44, 46.) *Experiment Station Record*, U. S. Department of Agriculture, vol. 58, No. 2, February, 1928, pp. 169–170.

"A general discussion of the steam impact principle of sterilization, including the theory of the process, the method of application, and its effect on various products and the results obtained by it on various milk products. Under proper conditions this new method renders a mass of milk or cream completely sterile by exposure for one minute at 230° F."

The Accuracy of Bacterial Counts from Milk. Robert S. Breed. *American Journal of Public Health*, vol. 17, No. 6, June, 1927, pp. 604–606. (Abstract by F. R. Shaw.)

The author points out that the word "count" in this connection is a misnomer and that the results of ordinary laboratory procedure are not infrequently used in a manner to suggest greater accuracy than is warranted, and that sometimes injustices in the grading of milk result from too fine a distinction. The "count" is, in reality, an "estimate," and its value is dependent upon the relative accuracy of the work. Emphasis is placed upon the importance of checking the accuracy of the estimates by one method of counting bacteria, by making duplicate estimates by one or more different methods.

It is pointed out that the cause of the greatest inaccuracies in agar plate counts is due to the existence of clumps of bacteria in milk—these clumps containing 2, 4, 6, 8, or even 25 to 30 individual bacteria. In view of this, the former practice of determining accuracy by agar plate counts on a series of samples or by different analysts is not considered of great value. There has occurred during recent months the unfortunate resurrection and broadcasting of past literature which cites unjustified conclusions regarding the accuracy of plate counts.

The author cites the studies of the New York Experimental Station in having "prepared samples of milk" examined by six analysts in two laboratories by the methods of group count, agar plate count, and individual bacteria count. The samples of milk containing the *B. coli* were prepared in such a way that the final counts were expected to be in the ratio of 1 : 2 : 4. The laboratory findings were remarkably close to these in each method of counting that was used. A point of particular interest is that the agar plate counts were intermediate between the group and individual bacteria microscopic counts.

Avoiding Pollution by Coke Oven Wastes. Hugh E. Jones. *Water Works Engineering*, vol. 81, No. 3, February 1, 1928, pp. 141–142 and 178. (Abstract by Chester Cohen.)

Phenol, or carbolic acid, is a product of destructive distillation of coal, and is present to the extent of less than one-half of 1 per cent in the ammonia liquor which condenses out of raw coke-oven gas. In the process of lime treatment of this ammonia liquor, the phenol combines to form calcium phenolate which passes into the sewers as still waste. Subsequent action of acids and carbon-dioxide in the water reduce the calcium phenolate to phenol which, in the event of subsequent chlorine sterilization of the water, produces the pronounced and disagreeable chlorophenol taste.

Investigations in late years have attempted to remove the phenols prior to the lime treatment. Two successful methods were evolved; namely, the benzol extraction method and the patented Tiddy-Hoffner, or distillation, method. Description of the first method is given, together with sketch of process and accompanying formula and reactions. Through operation of this benzol extraction method, the extraction efficiency has been raised over 96 per cent. More than 25,000 gallons of pure phenol are recovered yearly from the 36,000 gallons of ammonia liquor treated daily. The plant is financially self-supporting.

Creamery Waste Treatment. Elton D. Walker. Proceedings of the First Conference of Sewage Works Operators, Pennsylvania State College, July 13–14, 1926, Tech. Bulletin No. 1, pp. 49–53. (Abstract by J. B. Harrington.)

The writer of this article describes the trouble experienced in treating creamery wastes at the Pennsylvania State College sewage disposal plant, consisting of a screen chamber, in Imhoff tank, a trickling filter, chlorine disinfection, two settling basins, and two sludge beds. The creamery wastes when turned into the disposal plant caused an acid condition to exist. Proper digestion was not taking place, and the sludge was yellow, with a foul odor. When the acid condition was neutralized by lime, digestion again became active. More difficulty was experienced in checking the growth of *Oospora lactis* and *Leptomitus* on the inside of the sewer pipe. During the summer, strips of an inch or more in thickness and up to 30 feet in length would break loose clogging the screen, pipes, and nozzles at the plant. Tests were then made to determine the food of *Oospora lactis.* From these tests it was concluded that this organism grows most rapidly when lactic acid is present in amounts varying from 200 to 600 p. p. m. The next step was to determine the potential lactic acid in the creamery wastes and the amount of hydrated lime necessary to neutralize it. Treatment apparatus consisted of an oil barrel with two jets nearly tangential to a conical bottom. When necessary to clean the sewer, heavy doses of bleach were used.

Contact Beds. C. A. Emerson, jr. Proceedings of First Conference of Sewage Works Operators, Pennsylvania State College, July 13–14, 1926, Tech. Bulletin No. 1, pp. 37–38. (Abstract by J. B. Harrington.)

The construction and action of contact beds are explained, and the history of the development of this type of sewage treatment are briefly summarized. The physical appearance of the effluent is noted, as is the relative efficiency of fine grained and coarse grained beds. Contact beds require more head and produce less odor than trickling filters, and have their greatest usefulness in the field of small communities and institutions. It appears unlikely that they will be used for large cities, clogging and high construction costs being their chief disadvantages.

Sewage Treatment Works at Holland, Michigan. Paul Hansen and K. V. Hill. *The American City*, vol. 38, No. 1, January, 1928, pp. 168, 170. (Abstract by C. R. Cox.)

The sewage from Holland was formerly discharged without treatment into Black Lake, and, as a result, the lake was seriously polluted. This detracted from the value of the lake for recreational purposes, so the city authorities decided

to install a treatment plant to improve conditions. Tannery wastes also add to pollution, but a separate treatment plant is advocated for these wastes.

The disposal works consist of grit chamber, bar screens, pumping station, Imhoff tanks, chlorination apparatus and chlorine contact tank, and sludge beds. Provisions are made to add trickling filters at a future date if this is found desirable. Detention in Imhoff tanks is about three hours, with estimated future flow of 100 gallons per capita for a population of 22,500. Sludge digestion capacity is 2.6 cubic feet per capita. Sludge beds have area of 0.72 square feet per capita. Beds were to be inclosed in glass, but lack of funds prevented this.

Trickling Filters. Robert Hall Craig. Proceedings of the First Conference of Sewage Works Operators, Pennsylvania State College, July 13–14, 1926, Tech. Bulletin No. 1, pp. 39–41. (Abstract by J. B. Harrington.)

The trickling filter is a later development in sewage treatment than the contact bed, as the result of the demand for plants with a greater capacity per unit area. The advantages and disadvantages of trickling filters as compared with contact beds are briefly compared as follows: (1) Greater capacity per unit area; (2) a more complete nitrifying action in the trickling filters and a more stable effluent; (3) the chief disadvantage of trickling filters is the increased head (4 to 6 feet) necessary for operation.

Six rules of operation pertaining to the siphon dosing chamber, nozzles, ponding or pooling, testing of effluent, underdrains, and sprinkling pipe system are described briefly. Odors may be reduced by increasing the size of the spray and by the careful use of bleach.

Water Pollution in Louisiana. Percy Viosca, jr. Trans. Am. Fisheries Soc. 56, 101–7 (1926). Abstract by Edward Bartow in *Chemical Abstracts*, vol. 22, No. 4, February 20, 1928, p. 651.

"Oil pollution of streams in Louisiana, including H_2SO_4 from the refineries and salt from wells, has been lessened by oil traps and by the reuse of the acid. Pollution by paper-mills wastes is decreased by removal of pulp and oxidation in shallow ponds. Pollution by sugar-mill wastes is lessened by settling basins, where sedimentation and biological action take place. Pollution by gravel-washing plants can be prevented by keeping the clay and sand out of the rivers. Pollution by city sewage may be taken care of by extending the sewers to deep water."

Cannery Waste Disposal. A. Elliott Kimberley. *The Canner* 66, Serial No. 1717, 18–21 (1927). Abstract by Carl R. Fellers in *Chemical Abstracts*, vol. 22, No. 4, February 20, 1928, p. 656.

"Studies are reported on peas, green beans, lima beans, corn, succotash, and tomatoes. The attempt has been made so to modify cannery waste by oxidation that its powers of pollution are most substantially reduced. Data are presented on the units of pollution in terms of stream demand per day by screened wastes from representative packs and corresponding minimum stream flows required to prevent nuisance and to conserve fish life."

DEATHS DURING WEEK ENDED MARCH 24, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended March 24, 1928, and corresponding week of 1927. (From the Weekly Health Index, March 28, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended March 24, 1928	Corresponding week 1927
Policies in force	70, 702, 349	67, 112, 016
Number of death claims	14, 519	13, 742
Death claims per 1,000 policies in force, annual rate	10. 7	10. 7

Deaths from all causes in certain large cities of the United States during the week ended March 24, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, March 28, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Mar. 24, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 24, 1928 [2]
	Total deaths	Death rate [1]		Week ended Mar. 24, 1928	Corresponding week 1927	
Total (68 cities)	8,557	14.8	13.3	900	763	74
Akron	47			5	5	54
Albany [3]	38	16.5	15.3	4	4	82
Atlanta	76	15.6	16.5	8	10	
White	44		11.3	5	4	
Colored	32	(4)	28.9	3	6	
Baltimore [3]	275	17.3	15.7	25	19	79
White	213		14.7	15	14	60
Colored	62	(4)	21.2	10	5	157
Birmingham	67	15.8	16.8	7	9	60
White	33		13.0	5	5	69
Colored	34	(4)	22.8	2	4	45
Boston	227	14.9	14.5	38	22	105
Bridgeport	45			6	2	110
Buffalo	153	14.4	12.1	19	16	82
Cambridge	25	10.4	13.5	2	2	36
Camden	38	14.7	12.9	7	5	112
Canton	26	11.6	10.1	2	3	48
Chicago [3]	897	14.9	12.6	76	76	65
Cincinnati	181	22.9	16.8	17	8	103
Cleveland	234	12.1	10.2	19	22	52
Columbus	67	11.8	16.6	6	10	56
Dallas	51	12.3	10.3	6	5	
White	37		8.5	5	4	
Colored	14	(4)	22.8	1	1	
Denver	99	17.6	14.6	6	3	
Des Moines	36	12.4	15.8	3	3	50
Detroit	345	13.1	12.1	72	55	111
Duluth	18	8.1	10.5	1	2	23
El Paso	49	21.7	9.2	9	3	
Erie	30			4	2	82
Fall River [3]	33	12.8	14.9	0	9	0
Flint	31	10.9	9.5	6	4	77
Fort Worth	38	11.8	11.5	3	2	
White	28		10.5	1	2	
Colored	10	(4)	18.6	2	0	
Grand Rapids	33	10.5	9.3	4	5	60
Houston	52			6	3	
White	43			4	2	
Colored	9	(4)		2	1	
Indianapolis	110	15.1	11.1	4	8	30
White	88		10.6	4	5	35
Colored	22	(4)	15.1	0	3	0
Jersey City	82	13.2	12.0	10	4	75
Kansas City, Kans	43	19.0	14.2	8	2	169
White	27		11.4	4	2	99
Colored	16	(4)	27.1	4	0	581
Kansas City, Mo	124	16.6	12.2	9	2	64
Knoxville	25	12.4	18.4	0	1	0
White	19		14.5	0	1	0
Colored	6	(4)	47.0	0	0	0
Los Angeles	256			25	15	72
Lowell	37	17.5	11.3	2	4	42
Lynn	36	17.8	10.9	1	4	25
Memphis	76	20.9	22.7	6	10	70
White	34		15.3	2	5	37
Colored	42	(4)	36.2	4	5	125
Milwaukee	115	11.1	11.6	22	19	98
Minneapolis	98	11.2	10.8	6	6	36
Nashville	54	20.4	20.4	9	3	142
White	36		21.1	5	2	107
Colored	18	(4)	18.8	4	1	240
New Bedford	28	12.2	10.5	3	5	65

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, Mar. 23, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended March 24, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, March 28, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Mar. 24, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 24, 1928
	Total deaths	Death rate		Week ended Mar. 24, 1928	Corresponding week 1927	
New Haven	46	12.8	11.6	4	4	56
New Orleans	158	19.2	20.4	10	16	48
White	92		16.6	2	10	15
Colored	66	(4)	31.2	8	6	116
New York	1,751	15.2	12.9	195	150	79
Bronx Borough	233	12.8	11.0	20	18	60
Brooklyn Borough	592	13.4	10.9	68	61	68
Manhattan Borough	719	21.5	18.5	81	57	96
Queens Borough	163	10.0	8.5	21	13	85
Richmond Borough	44	15.3	12.4	5	1	90
Newark, N. J	116	12.8	13.0	11	10	57
Oakland	66	12.6	12.5	4	5	43
Oklahoma City	31			3	3	
Omaha	69	16.2	13.8	3	7	35
Paterson	42	15.2	14.1	4	1	69
Philadelphia	508	14.4	14.3	66	49	89
Pittsburgh	190	15.5	12.0	30	17	98
Portland, Oreg	80			2	0	21
Providence	86	15.7	12.1	7	8	61
Richmond	60	16.1	17.9	9	7	118
White	36		13.8	3	2	61
Colored	24	(4)	28.1	6	5	220
Rochester	103	16.4	12.4	8	8	65
St. Louis	307	18.9	13.6	19	14	64
St. Paul	67	13.9	15.4	7	12	67
Salt Lake City [3]	32	12.1	12.3	7	4	114
San Antonio	85	20.4	14.6	16	7	
San Diego	49	21.4	19.9	6	3	114
San Francisco	169	15.1	14.3	7	6	44
Schenectady	14	7.8	10.6	2	2	63
Seattle	70	9.6	10.6	5	5	51
Somerville	25	12.7	9.8	2	4	69
Spokane	31	14.9	15.8	3	0	77
Springfield, Mass	35	12.2	9.9	2	5	32
Syracuse	44	11.5	13.5	5	8	61
Tacoma	18	8.5	13.1	0	3	0
Toledo	69	11.5	12.8	6	8	58
Trenton	42	15.8	13.0	9	3	153
Utica	33	16.6	22.2	2	1	45
Washington, D. C	177	16.8	12.7	14	8	80
White	108		10.1	6	3	50
Colored	69	(4)	20.7	8	5	148
Waterbury	20			2	3	58
Wilmington, Del	24	9.8	9.5	4	0	105
Worcester	67	17.7	10.8	6	14	73
Yonkers	25	10.8	14.0	2	6	46
Youngstown	45	13.5	12.0	5	3	67

[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended April 2, 1927, and March 31, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 2, 1927, and March 31, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928
New England States:								
Maine	4	2	18	13	211	73	0	0
New Hampshire				11		31		0
Vermont	2	1			114	88	0	0
Massachusetts	94	88	17	11	324	1,930	0	3
Rhode Island	10	14		10	2	204	0	0
Connecticut	20	39	11	11	102	317	0	1
Middle Atlantic States:								
New York	490	315	[1] 51	[1] 67	729	2,711	7	13
New Jersey	115	128	21	39	45	1,442	1	2
Pennsylvania	196	199			962	1,469	5	9
East North Central States:								
Ohio		174		88		966		3
Indiana	40	22	58	31	275	204	0	0
Illinois	123	143	33	387	2,031	180	8	12
Michigan	105	63		8	220	1,376	0	7
Wisconsin	29	33	50	105	743	149	12	6
West North Central States:								
Minnesota	35	19			281	111	6	2
Iowa [2]	13	16			584	55	0	0
Missouri	58	36	4	53	216		4	12
North Dakota	3				253	2	3	2
South Dakota	3		11	30	285	39	0	0
Nebraska	6	10		84	327	87	0	0
Kansas	12	8	11	31	1,230	115	1	6
South Atlantic States:								
Delaware	1		3		5	19	0	0
Maryland [2]	56	33	136	48	58	1,020	0	2
District of Columbia	13		1		4		0	
Virginia								
West Virginia	21	19	99	43	194	88	1	1
North Carolina	16	38			782	2,913	0	0
South Carolina	23	16	1,978	905	258	765	0	0
Georgia	7	13	299	140	333	259	0	1
Florida	20	6	8		228	66	0	0
East South Central States:								
Kentucky				31		399		0
Tennessee	15	14	229	126	96	273	2	2
Alabama	19	10	230	311	253	580	1	1
Mississippi	9	14						2

[1] New York City only. [2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 2, 1927, and March 31, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928
West South Central States:		9	87	583	230	556	0	0
Arkansas	9	18	19	77	90	250	0	1
Louisiana	27	18	120	416	230	443	0	4
Oklahoma [3]	11	34	38	48	241	121	0	0
Texas	23							
Mountain States:		9	-------	-------	49	2	1	0
Montana	4	1	-------	-------	91	-------	0	3
Idaho	2	-------	1	-------	81	30	0	2
Wyoming	1	27	-------	13	426	44	1	18
Colorado	6	8	-------	6	63	160	0	0
New Mexico	4	5	1	-------	15	33	0	2
Arizona	1	5	7	4	67	5	0	2
Utah	6							
Pacific States:		5	-------	2	401	193	3	2
Washington	13	0	93	31	238	69	2	3
Oregon	12	89	107	30	3,010	184	9	4
California	147							

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928
New England States:								
Maine	0	1	22	51	0	0	0	3
New Hampshire	-------	0	-------	14	-------	0	-------	0
Vermont	0	0	12	11	0	0	1	1
Massachusetts	0	0	505	300	0	0	13	4
Rhode Island	0	0	24	60	0	0	0	1
Connecticut	1	0	94	222	0	0	0	1
Middle Atlantic States:								
New York	2	5	1,304	911	10	2	20	17
New Jersey	0	0	365	328	0	16	3	4
Pennsylvania	1	0	702	587	1	1	23	10
East North Central States:								
Ohio	-------	4	-------	255	-------	30	-------	5
Indiana	0	0	250	115	213	123	6	2
Illinois	0	0	331	381	32	[4] 56	4	6
Michigan	0	0	318	264	34	23	5	4
Wisconsin	2	1	198	187	9	9	5	3
West North Central States:								
Minnesota	0	1	305	175	4	2	1	6
Iowa	0	0	72	96	20	81	0	3
Missouri	0	2	146	114	19	53	1	1
North Dakota	0	0	73	73	9	3	2	1
South Dakota	0	1	110	46	15	12	1	0
Nebraska	0	0	71	106	12	47	0	0
Kansas	0	2	194	153	47	90	2	1
South Atlantic States:								
Delaware	0	0	19	1	0	0	0	0
Maryland [1]	0	0	71	71	0	2	8	7
District of Columbia	0	-------	31	-------	0	-------	2	-------
Virginia	0	-------	-------	-------	2	-------	-------	-------
West Virginia	0	0	34	35	32	62	4	7
North Carolina	0	0	29	31	74	115	2	2
South Carolina	3	1	3	2	21	6	10	1
Georgia	0	0	13	20	84	0	8	9
Florida	0	0	8	7	84	12	12	9
East South Central States:								
Kentucky	-------	0	-------	66	-------	18	-------	2
Tennessee	0	2	20	13	8	13	12	4
Alabama	0	0	19	8	85	10	14	13
Mississippi	0	1	13	7	3	2	19	9

[1] Week ended Friday.
[3] Figures for 1927 are exclusive of Oklahoma City and Tulsa and for 1928 are exclusive of Tulsa.
[4] For the week ended Mar. 24, 1928, 58 cases of smallpox were reported in Illinois instead of 88, as published in Public Health Reports for Mar. 30, 1928, p. 775.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 2, 1927, and March 31, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928	Week ended Apr. 2, 1927	Week ended Mar. 31, 1928
West South Central States:								
Arkansas	0	0	6	9	3	7	8	11
Louisiana	0	0	6	11	4	25	19	3
Oklahoma [3]	0	0	0	00	37	203	9	4
Texas	0	0	19	53	62	37	1	0
Mountain States:								
Montana	0	0	66	6	21	9	1	0
Idaho	0	1	26	6	5	8	0	0
Wyoming	1	1	24	17	1	4	0	1
Colorado	0	0	208	81	10	2	2	0
New Mexico	0	0	23	33	2	1	0	0
Arizona	0	1	9	4	0	30	0	4
Utah	0	0	29	3	0	18	0	0
Pacific States:								
Washington	1	1	106	48	60	51	7	7
Oregon	0	3	45	18	18	75	6	2
California	3	3	220	154	25	14	10	8

[3] Figures for 1927 are exclusive of Oklahoma City and Tulsa and for 1928 are exclusive of Tulsa.

Report for Week Ended March 24, 1928

NEW MEXICO	Cases	NEW MEXICO—continued	Cases
Diphtheria	1	Poliomyelitis	1
Influenza	7	Scarlet fever	35
Measles	165	Smallpox	

Report for Week Ended March 17, 1928

SOUTH DAKOTA	Cases	SOUTH DAKOTA—continued	Cases
Diphtheria	7	Poliomyelitis	3
Influenza	45	Scarlet fever	29
Measles	29	Smallpox	10

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February, 1928										
Arkansas	1	45	1,436	96	2,396	63	0	147	81	22
California	31	641	288	16	864		53	1,111	191	50
Idaho	12	5	1				2	52	36	1
Illinois	26	706	154	2	489		6	1,459	206	45
Kansas	6	77	178		181	1	1	813	302	3
Maine	2	20	15		169		0	122	0	8
Michigan	0	301	2		2,586		4	1,297	139	31
Mississippi	2	75	11,356	2,337	6,382	349	4	95	134	47
Missouri	10	228	118	6	565		2	468	190	11
Montana	23	46			9		0	97	78	0
New York	49	1,714			6,824		12	3,330	42	68
North Carolina	2	183			17,433		2	177	498	12
Oklahoma [1]	5	114	1,046	57	721	14	5	260	589	43
Oregon	7	46	145		267		7	114	184	11
Rhode Island	1	67	43		176		0	264	0	5
West Virginia	2	86	189		423		1	226	251	44
Wisconsin	14	142	274		829		8	803	109	11

[1] Exclusive of Oklahoma City and Tulsa.

February, 1928	Cases
Actinomycosis:	
California	1
Anthrax:	
California	1
New York	4
Oklahoma [1]	1
Chicken pox:	
Arkansas	171
California	2,876
Idaho	58
Illinois	1,745
Kansas	702
Maine	119
Michigan	719
Mississippi	885
Missouri	293
Montana	72
New York	2,372
North Carolina	693
Oklahoma [1]	174
Oregon	258
Rhode Island	44
West Virginia	186
Wisconsin	920
Coccidiosis:	
California	4
Conjunctivitis.	
Idaho	3
Dengue:	
Mississippi	3
Dysentery:	
California –	
(amebic)	6
(bacillary)	9
Illinois	19
Kansas (bacillary)	8
Mississippi	
(amebic)	29
(bacillary)	267
Oklahoma [1]	8
German measles:	
California	1,809
Illinois	31
Kansas	30
Maine	2
Montana	4
New York	538
North Carolina	15
Wisconsin	42
Hookworm disease:	
Arkansas	12
Mississippi	233
Impetigo contagiosa:	
Oregon	12
Jaundice:	
California	2
Lead poisoning:	
Illinois	8
Leprosy:	
California	1
Lethargic encephalitis:	
California	3
Illinois	6
Michigan	5
Montana	1
New York	32
Oregon	1
Wisconsin	5

[1] Exclusive of Oklahoma City and Tulsa.

Mumps:	Cases
Arkansas	232
California	1,329
Idaho	151
Illinois	1,380
Kansas	420
Maine	141
Michigan	1,775
Mississippi	1,322
Missouri	820
Montana	8
New York	3,004
Oklahoma [1]	73
Oregon	88
Rhode Island	143
Wisconsin	914
Ophthalmia neonatorum:	
Arkansas	4
California	2
Illinois	22
Mississippi	6
Missouri	2
New York	6
Oklahoma [1]	2
Rhode Island	1
Paratyphoid fever:	
California	1
Idaho	1
Illinois	2
New York	1
Kansas	4
Plague:	
California	1
Puerperal septicemia:	
Illinois	7
Mississippi	42
New York	15
Rabies in animals:	
California	93
Idaho	1
Mississippi	6
Missouri	2
New York	12
Oregon	2
Rhode Island	8
Rabies in man:	
Illinois	1
Rocky Mountain spotted or tick fever:	
Montana	1
Scabies:	
Oregon	14
Septic sore throat:	
Idaho	1
Illinois	10
Kansas	1
Michigan	30
Missouri	21
Montana	1
New York	14
North Carolina	14
Oklahoma [1]	6
Oregon	9
Rhode Island	5
Tetanus.	
California	3
Illinois	2
Missouri	4
New York	1
Oklahoma	1

	Cases
Trachoma:	
Arkansas	146
California	24
Illinois	8
Kansas	4
Mississippi	22
Missouri	3
New York	1
Oklahoma [1]	6
Wisconsin	8
Trichinosis:	
California	3
Tularaemia:	
Arkansas	1
Typhus fever:	
California	1
Undulant (Malta) fever:	
California	2
Vincent's angina:	
Illinois	1
Kansas	1
Vincent's angina—Continued.	
Maine	15
New York	
Whooping cough:	
Arkansas	101
California	738
Idaho	10
Illinois	1,239
Kansas	365
Maine	132
Michigan	666
Mississippi	1,563
Missouri	268
Montana	12
New York	2,010
North Carolina	679
Oklahoma [1]	42
Oregon	21
Rhode Island	28
West Virginia	74
Wisconsin	386

Number of Cases of Certain Communicable Diseases Reported for the Month of December, 1927, by State Health Officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	142	335	425	123	132	18	321	73	67
Arizona	29	41	18	22	11	2	93	10	6
Arkansas	90	81	92	93	51	13	[2] 23	25	26
California	1,116	613	183	321	728	68	667	39	369
Colorado	352	70	68	69	285	30	104	11	53
Connecticut	428	196	193	146	302	0	108	6	470
Delaware	20	17	29	30	15	0	9	5	5
District of Columbia	107	63	11		135	0	90	2	29
Florida	55	74	24	12	46	3	51	14	4
Georgia	115	107	224	41	97	24	21	52	33
Idaho	86	20	6	43	72	28	[2] 2	1	1
Illinois	1,477	844	124	686	1,229	100	1,245	60	820
Indiana	322	216	178	68	421	357	152	24	77
Iowa	206	78	51	98	309	261	32	12	32
Kansas	902	138	92	118	559	260	164	23	253
Kentucky [3]									
Louisiana	19	148	168		56	27	[2] 151	34	30
Maine	227	41	221	126	207	0	23	28	103
Maryland	507	168	404	57	133	0	213	49	110
Massachusetts	1,045	590	2,552	590	1,217	1	395	25	735
Michigan	786	457	1,216	658	1,011	144	426	57	446
Minnesota	560	171	17		564	7	238	18	25
Mississippi	656	185	2,260	555	128	16	264	64	1,170
Missouri	500	332	105	371	508	190	227	41	138
Montana	75	16	4	4	90	84	54	3	11
Nebraska	502	121	37	133	252	95	20	8	22
Nevada [4]									
New Hampshire		6			49	0		0	
New Jersey	755	714	343		594	12	361	18	667
New Mexico [3]									
New York	2,250	1,637	1,780	1,437	1,911	33	1,761	98	1,790
North Carolina	598	346	5,727		317	203		12	364
North Dakota	217	18	24	18	215	10	7	2	24
Ohio	1,722	900	695	720	1,185	86	653	117	404
Oklahoma [1]	95	309	318	16	205	328	66	116	27
Oregon	249	63	82	62	134	180	31	22	18
Pennsylvania	3,301	1,303	3,129	1,903	2,073	3	779	108	873
Rhode Island	38	106	34	69	164	0	28	2	7
South Carolina	211	379	2,210		100	17	264	83	309
South Dakota	58	7	104	35	205	52	5	7	16
Tennessee	130	167	1,167	117	192	63	171	90	65
Texas [3]									
Utah [3]									
Vermont	325	9	18	76	46	0	12	0	
Virginia	583	279	743		287	3	[2] 37	34	401
Washington	315	74	676	200	222	186	171	23	83
West Virginia	217	117	844		298	127	37	126	61
Wisconsin	1,424	240	397	495	740	178	135	14	393
Wyoming	56	2	20	10	87	14	2	7	28

[1] Exclusive of Oklahoma City and Tulsa.
[2] Pulmonary.
[3] Reports received weekly.
[4] Reports received annually.

Case Rates per 1,000 Population (annual basis) for the Month of December, 1927

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	0.66	1.55	1.96	0.57	0.61	0.08	1.48	0.34	0.31
Arizona	.74	1.05	.46	.56	.28	.05	2.39	.26	.15
Arkansas	.61	.50	.56	.57	.31	.08	[1] .14	.15	.16
California	2.96	1.63	.49	.85	1.93	.18	1.77	.10	.98
Colorado	3.86	.87	.75	.76	3.12	.33	1.14	.12	.58
Connecticut	3.08	1.41	1.39	1.05	2.17	.00	.78	.04	3.38
Delaware	.97	.82	1.41	1.45	.73	.00	.44	.24	.24
District of Columbia	2.33	1.37	.24	------	2.94	.00	1.96	.04	.63
Florida	.48	.54	.21	.10	.40	.03	.44	.12	.08
Georgia	.43	.40	.83	.15	.36	.09	.08	.19	.12
Idaho	1.90	.44	.13	.95	1.59	.62	[1] .04	.02	.02
Illinois	2.38	1.36	.20	1.11	1.98	.16	2.01	.11	1.32
Indiana	1.20	.81	.67	.25	1.57	1.33	.57	.09	.29
Iowa	1.00	.38	.25	.48	1.50	1.27	.16	.06	.16
Kansas	5.81	.89	.59	.76	3.60	1.67	1.06	.15	1.63
Kentucky [3]	------	------	------	------	------	------	------	------	------
Louisiana	.12	.90	1.02	------	.34	.16	[1] .92	.21	.18
Maine	3.37	.61	3.28	1.87	3.07	.00	.34	.42	1.53
Maryland	3.74	1.24	2.98	.42	.98	.00	1.57	.36	.81
Massachusetts	2.90	1.64	7.08	1.64	3.38	.00	1.10	.07	2.10
Michigan	2.06	1.20	3.19	1.73	2.65	.38	1.12	.15	1.17
Minnesota	2.46	.75	.07	------	2.47	.08	1.02	.08	.11
Mississippi	4.31	1.22	14.86	3.65	.84	.11	1.74	.42	7.69
Missouri	1.68	1.11	.35	1.24	1.70	.64	.76	.14	.46
Montana	1.24	.26	.07	.07	1.48	1.39	.89	.05	.18
Nebraska	4.23	1.02	.31	1.12	2.13	.80	.17	.07	.19
Nevada [3]	------	------	------	------	------	------	------	------	------
New Hampshire	------	.16	------	------	[illegible].27	.00	------	.00	------
New Jersey	2.37	2.24	1.08	------	1.87	.04	1.13	.06	2.10
New Mexico [2]	------	------	------	------	------	------	------	------	------
New York	2.32	1.69	1.84	1.48	1.97	.08	1.82	.10	1.85
North Carolina	2.43	1.41	23.27	------	1.29	.82	------	.05	1.48
North Dakota	3.98	.33	.44	.33	3.95	.18	.13	.04	.44
Ohio	3.02	1.58	1.22	1.26	2.08	.15	1.15	.21	.71
Oklahoma [4]	.53	1.71	1.76	.09	1.14	1.82	.37	.64	.15
Oregon	3.29	.83	1.08	.82	1.77	2.38	.41	.29	.24
Pennsylvania	3.90	1.58	3.79	2.30	2.51	.00	.94	.13	1.06
Rhode Island	.64	1.77	.57	1.15	2.74	.00	.47	.03	.12
South Carolina	1.35	2.42	14.10	------	.64	.11	1.68	.53	2.55
South Dakota	.98	.12	1.76	.59	3.47	.88	.08	.12	.27
Tennessee	.62	.79	5.53	.55	.91	.30	.81	.43	.31
Texas [3]	------	------	------	------	------	------	------	------	------
Utah [3]	------	------	------	------	------	------	------	------	------
Vermont	10.86	.30	.60	2.54	1.54	.00	.40	.00	------
Virginia	2.70	1.29	3.44	------	1.33	.01	[1] .17	.16	1.85
Washington	2.87	.56	5.10	1.51	1.67	1.40	1.29	.17	.25
West Virginia	1.51	.81	1.69	------	2.07	.88	.26	.87	.56
Wisconsin	5.75	.97	1.60	2.00	2.99	.72	.54	.06	1.59
Wyoming	2.74	.10	.98	.49	4.25	.68	.10	.34	1.37

[1] Pulmonary.
[2] Reports received weekly.
[3] Reports received annually.
[4] Exclusive of Oklahoma City and Tulsa.

PLAGUE-PREVENTION WORK IN THE UNITED STATES

Seattle, Wash.—The report of rat-trapping operations of the United States quarantine station at Seattle for the month of February, 1928, shows a total of 927 rodents taken and 288 examined during the month. None was reported plague-infected.

Los Angeles, Calif.—The rodent division of the Los Angeles Board of Health reports 5,924 rodents collected, and 3,536 examined during the six weeks from February 5 to March 17, 1928. None was found plague-infected.

California.—The weekly reports of plague-suppressive measures in California during the nine weeks from January 8 to March 10, 1928, show a total of 6,417 rodents received and 5,362 examined during the period. Six ground squirrels were reported as plague-infected February 25 to 28, 1928, in Santa Cruz, Calif. The last case of human plague was reported as occurring on February 9, 1928, at Santa Cruz.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 98 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of nearly 31,500,000. The estimated population of the 93 cities reporting deaths is more than 30,875,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended March 17, 1928, and March 19, 1927

	1928	1927	Estimated expectancy		1928	1927	Estimated expectancy
Cases reported				*Cases reported*—Contd.			
Diphtheria:				Typhoid fever:			
42 States	1,040	1,737		42 States	148	233	
98 cities	955	1,045	921	98 cities	27	40	37
Measles:				*Deaths reported*			
41 States	18,641	15,567					
98 cities	8,152	5,455		Influenza and pneumonia:			
Poliomyelitis:				92 cities	1,449	1,251	
42 States	24	16		Smallpox:			
Scarlet fever:				93 cities	1	1	
42 States	4,563	6,150		Sacramento	1	0	
98 cities	1,813	2,556	1,430	Atlanta	0	1	
Smallpox:							
42 States	1,335	1,097					
98 cities	126	182	132				

City reports for week ended March 17, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine yrs. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
NEW ENGLAND									
Maine:									
Portland	76,400	10	1	0	0	0	1	23	0
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	1
Manchester	84,000	0	2	0	0	2	2	0	6
Vermont:									
Barre	[1] 10,008		0						
Burlington	[1] 24,089	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	59	46	21	4	0	649	10	53
Fall River	131,000	4	3	1	2	0	0	0	2
Springfield	145,000	14	4	11	1	1	3	85	1
Worcester	193,000	24	4	7	2	1	35	68	7

[1] Estimated, July 1, 1925.

City reports for week ended March 17, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND—con.									
Rhode Island									
Pawtucket	71,000	2	1	0	0	0	4	23	4
Providence	275,000	3	8	9	0	0	57	17	15
Connecticut:									
Bridgeport	(2)	4	7	8	0	0	1	0	4
Hartford	164,000	4	8	2	0	0	23	1	2
New Haven	182,000	4	2	0	0	1	218	96	14
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	14	11	13	-------	0	400	48	26
New York	5,924,000	251	226	293	60	26	1,071	38	312
Rochester	321,000	15	11	6	-------	0	43	25	10
Syracuse	185,000	48	5	1	-------	0	117	16	4
New Jersey:									
Camden	131,000	5	5	5	0	0	12	0	10
Newark	459,000	34	13	34	8	0	383	17	18
Trenton	134,000	2	3	2	0	1	9	1	4
Pennsylvania:									
Philadelphia	2,008,000	80	73	53	0	20	307	80	106
Pittsburgh	637,000	40	20	23	0	4	148	116	31
Reading	114,000	7	3	5	0	2	0	1	9
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	5	8	19	0	0	162	0	0
Cleveland	960,000	71	28	50	16	2	58	212	35
Columbus	285,000	4	4	1	0	0	17	3	4
Toledo	295,000	51	5	3	2	1	455	13	2
Indiana:									
Fort Wayne	99,900	5	2	4	0	0	1	0	0
Indianapolis	367,000	28	7	4	0	2	71	125	19
South Bend	81,700	1	1	0	0	0	0	0	2
Terre Haute	71,900	2	0	2	0	0	0	0	2
Illinois:									
Chicago	3,048,000	122	79	85	28	6	55	61	150
Springfield	64,700	13	1	1	3	3	0	10	5
Michigan:									
Detroit	1,290,000	81	56	31	10	4	1,165	62	57
Flint	136,000	10	4	2	0	1	76	223	5
Grand Rapids	156,000	3	2	2	0	0	17	15	2
Wisconsin:									
Kenosha	52,700	32	2	0	0	0	0	0	0
Milwaukee	517,000	79	17	6	0	0	1	46	15
Racine	69,400	4	2	0	0	0	1	4	0
Superior	1 39,671	3	1	0	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	3	0	0	0	0	3	3	5
Minneapolis	434,000	71	15	16	0	3	96	205	11
St. Paul	248,000	19	12	0	0	2	0	50	12
Iowa:									
Davenport	1 52,469	10	1	0	0	-------	0	0	-------
Des Moines	146,000	0	2	1	0	-------	0	0	-------
Sioux City	78,000	-------	1	-------	-------	-------	-------	-------	-------
Waterloo	36,900	4	0	0	0	-------	0	11	-------
Missouri:									
Kansas City	375,000	54	6	5	1	3	35	172	19
St. Joseph	78,400	0	1	0	0	0	1	3	3
St. Louis	830,000	16	40	34	2	0	150	18	-------
North Dakota:									
Fargo	1 26,403	3	1	0	0	0	0	3	0
Grand Forks	1 14,811	0	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	1 15,036	4	0	0	0	-------	0	0	-------
Sioux Falls	1 30,127	0	1	0	0	0	0	0	0
Nebraska:									
Omaha	216,000	12	3	2	0	0	3	1	9
Kansas:									
Topeka	56,500	32	1	1	1	0	1	6	1
Wichita	92,500	7	2	1	0	0	1	0	5

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended March 17, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	4	2	8	0	0	5	3	3
Maryland:									
Baltimore	808,000	115	28	22	29	4	944	21	48
Cumberland	[1] 33,741	5	1	0	0	0	0	0	1
Frederick	[1] 12,035	1	1	2	0	0	3	0	0
District of Columbia:									
Washington	528,000	28	12	25	0	0	198	0	23
Virginia:									
Lynchburg	30,500	2	0	2	0	0	13	1	2
Norfolk	174,000	25	1	0	0	0	69	3	9
Richmond	189,000	10	2	4	0	1	165	2	5
Roanoke	61,900	4	1	2	0	0	11	4	3
West Virginia:									
Charleston	50,700	6	0	0	0	0	1	0	0
Wheeling	[1] 56,208	8	1	0	0	0	3	0	2
North Carolina:									
Raleigh	[1] 30,371	0	0	2	0	0	89	0	0
Wilmington	37,700	0	0	0	0	1	9	0	4
Winston-Salem	71,800	4	1	1	0	0	97	8	5
South Carolina:									
Charleston	74,100	1	1	2	34	0	0	0	3
Columbia	41,800	15	0	3	0	1	21	23	8
Greenville	[1] 27,311	1	0	0	0	0	3	4	0
Georgia:									
Atlanta	(2)	23	2	5	42	3	21	8	0
Brunswick	[1] 16,809	0	0	0	0	1	37	3	1
Savannah	94,900	2	1	1	8	0	6	3	3
Florida:									
Miami	[1] 69,754	11	2	3	2	0	2	7	2
St. Petersburg	[1] 26,847	0	0	0	0	0	0	0	3
Tampa	102,000	9	2	0	0	0	0	4	2
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	0	0	0	0	0	15	0	5
Louisville	311,000	3	4	4	11	0	112	3	29
Tennessee:									
Memphis	177,000	14	4	13	0	5	75	24	3
Nashville	137,000	8	1	2	0	3	30	6	13
Alabama:									
Birmingham	211,000	16	2	2	35	5	122	7	9
Mobile	66,800	----	0	----	----	----	----	----	----
Montgomery	47,000	12	0	0	0	----	17	0	----
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	3	0	0	0	----	4	1	----
Little Rock	75,900	3	1	1	7	2	36	1	0
Louisiana:									
New Orleans	419,000	20	9	13	9	8	1	0	25
Shreveport	59,500	16	0	1	0	1	186	1	3
Oklahoma:									
Oklahoma City	(2)	4	1	0	17	0	31	4	4
Texas:									
Dallas	203,000	48	5	3	13	4	4	1	6
Fort Worth	159,000	27	3	1	0	3	13	3	4
Galveston	49,100	6	0	5	0	0	21	5	3
Houston	[1] 164,954	8	3	7	0	2	49	8	5
San Antonio	204,000	2	2	4	0	11	31	0	22
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	1	0	0	0	0	0
Great Falls	[1] 29,883	12	1	0	0	1	0	0	0
Helena	[1] 12,037	2	0	2	0	0	0	0	1
Missoula	[1] 12,668	1	0	0	0	0	0	0	0

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended March 17, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MOUNTAIN—contd.									
Idaho:									
Boise	[1] 23,042	1	0	0	0	0	0	1	0
Colorado:									
Denver	285,000	60	9	8	-------	5	38	100	16
Pueblo	43,900	5	1	0	0	0	0	0	1
Utah:									
Salt Lake City	133,000	22	3	1	0	3	1	0	5
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	
PACIFIC									
Washington:									
Seattle	(2)	16	6		0	-------	224	20	-------
Spokane	109,000	6	2	0	0	-------	0	0	-------
Tacoma	106,000	24	1	2	0	0	5	29	6
Oregon:									
Portland	[1] 282,383	17	8	5	2	0	11	2	4
California:									
Los Angeles	(2)	162	41	35	22	2	34	116	23
Sacramento	73,400	23	1	3	0	0	15	3	2
San Francisco	567,000	120	2	8	2	1	47	65	6

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	4	5	0	0	0	1	0	1	0	2	19
New Hampshire:											
Concord	0	0	0	0	0	2	0	0	0	0	13
Manchester	2	6	0	0	0	1	0	0	0	0	27
Vermont:											
Barre	0	-------	0	-------	-------	-------	0	-------	-------	-------	-------
Burlington	1	0	0	0	0	1	0	0	0	0	6
Massachusetts:											
Boston	83	89	0	0	0	18	1	2	0	85	271
Fall River	4	12	0	0	0	0	0	0	0	0	20
Springfield	6	23	0	0	0	3	0	0	0	3	34
Worcester	10	2	0	0	0	3	0	0	0	17	57
Rhode Island:											
Pawtucket	1	2	0	0	0	1	0	0	0	0	24
Providence	10	32	0	0	0	3	0	0	0	3	82
Connecticut:											
Bridgeport	13	7	0	0	0	2	0	0	0	1	46
Hartford	7	2	0	0	0	1	0	0	0	8	31
New Haven	11	1	0	0	0	5	0	0	0	26	61
MIDDLE ATLANTIC											
New York:											
Buffalo	24	57	0	0	0	12	0	1	0	23	155
New York	301	430	0	0	0	124	8	2	1	171	1,723
Rochester	16	13	0	0	0	4	0	1	0	8	89
Syracuse	13	12	0	0	0	4	0	0	0	28	50
New Jersey:											
Camden	6	2	0	0	0	1	0	0	0	1	42
Newark	34	41	0	0	0	8	0	0	0	23	135
Trenton	5	5	0	0	0	6	0	0	0	4	38
Pennsylvania:											
Philadelphia	86	100	0	0	0	43	3	0	1	75	627
Pittsburgh	31	23	0	0	0	8	0	1	0	21	188
Reading	4	40	0	0	0	0	1	0	0	2	42

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended March 17, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths all causes
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	19	36	1	1	0	6	1	0	0	11	
Cleveland	48	27	0	0	0	20	1	0	0	76	211
Columbus	12	8	2	0	0	3	0	0	0	0	68
Toledo	15	2	2	0	0	9	0	3	0	10	87
Indiana:											
Fort Wayne	6	4	2	0	0	3	1	1	0	0	20
Indianapolis	10	14	11	6	0	9	0	0	0	6	112
South Bend	3	2	1	0	0	0	0	0	0	7	12
Terre Haute	3	1	1	17	0	1	0	0	0	0	28
Illinois:											
Chicago	133	134	3	11	0	66	2	3	0	112	880
Springfield	2	17	0	1	0	1	0	0	0	1	29
Michigan:											
Detroit	99	118	2	1	0	20	1	0	0	60	355
Flint	7	19	1	2	0	2	0	0	0	4	28
Grand Rapids	11	3	0	0	0	0	0	0	0	0	33
Wisconsin:											
Kenosha	3	4	1	1	0	0	0	0	0	4	11
Milwaukee	29	54	3	0	0	7	0	0	0	14	121
Racine	4	7	0	0	0	0	0	0	0	7	10
Superior	4	5	1	0	0	0	0	0	0	0	7
WEST NORTH CENTRAL											
Minnesota:											
Duluth	9	7	1	0	0	0	0	0	0	8	25
Minneapolis	57	23	5	1	0	1	0	0	0	13	101
St. Paul	34	10	6	0	0	5	0	0	0	40	84
Iowa:											
Davenport	1	6	4	0			0	1		0	
Des Moines	6	12	1	15			0	0		0	33
Sioux City	2		2				0				
Waterloo	2	6	0	0			0	0		4	
Missouri:											
Kansas City	12	38	4	5	0	6	0	1	1	36	116
St. Joseph	3	1	1	7	0	1	0	0	0	1	
St. Louis	38	35	5	1	0	13	1	0	0	20	308
North Dakota:											
Fargo	2	2	0	0	0	1	0	0	0	3	8
Grand Forks	0	0	0	0			0	0		0	
South Dakota:											
Aberdeen	4	0	0	0			0	0		0	
Sioux Falls	2	2	0	0	0	0	0	0	0	0	0
Nebraska:											
Omaha	3	11	8	2	0	2	0	0	0	1	61
Kansas:											
Topeka	1	2	0	0	0	0	0	1	0	3	15
Wichita	1	4	1	15	0	0	0	0	0	0	29
SOUTH ATLANTIC											
Delaware:											
Wilmington	5		0	0	0	2	0	0	0	0	35
Maryland:											
Baltimore	39	30	0	0	0	21	2	1	0	48	275
Cumberland	1	3	0	0	0	1	1	0	0	1	14
Frederick	1	0	0	0	0	0	0	0	0	0	2
District of Columbia:											
Washington	25	45	2	9	0	13	1	0	0	5	174
Virginia:											
Lynchburg	0	0	0	0	0	1	0	0	0	8	15
Norfolk	1	13	0	0	0	3	0	0	0	1	
Richmond	3	5	1	0	0	1	0	2	0	0	57
Roanoke	1	4	1	0	0	1	0	0	0	0	17
West Virginia:											
Charleston	0	3	1	0	0	3	0	0	1	2	24
Wheeling	2	0	0	0	0	1	1	0	0	0	18

City reports for week ended March 17, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
North Carolina:											
Raleigh	0	0	0	4	0	0	0	0	0	0	9
Wilmington	0	0	0	0	0	1	0	0	0	0	15
Winston-Salem	0	0	5	0	0	0	0	0	0	0	17
South Carolina:											
Charleston	1	0	0	2	0	3	0	0	0	0	23
Columbia	1	0	0	0	0	0	0	0	0	1	29
Greenville	0	1	0	0	0	0	0	0	0	0	3
Georgia:											
Atlanta	4	17	5	1	0	4	0	1	1	5	83
Brunswick	0	0	0	0	0	1	0	0	0	0	7
Savannah	1	1	0	3	0	1	0	1	1	0	32
Florida:											
Miami	2	1	0	0	0	2	1	0	0	0	31
St. Petersburg	2		0		0	2	0		0		11
Tampa	0	1	0	0	0	2	1	1	1	0	33
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	2	1	0	0	3	0	0	0	0	
Louisville	6	23	1	1	0	7	1	0	0	1	104
Tennessee:											
Memphis	4	2	3	3	0	4	1	1	0	1	62
Nashville	3	1	1	0	0	4	0	1	0	0	53
Alabama:											
Birmingham	4	3	8	0	0	5	1	0	0	4	62
Mobile	0		1				0				
Montgomery	0	0	1	0			0	0		0	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	1	1	0			0	0		1	
Little Rock	1	6	1	0	0	5	0	0	0	0	
Louisiana:											
New Orleans	7	13	1	5	0	6	2	2	1	1	168
Shreveport	1	2	1	2	0	1	0	0	1	3	31
Oklahoma:											
Oklahoma City	2	2	3	10	0	1	1	0	0	0	26
Texas:											
Dallas	2	24	5	4	0	4	1	1	1	8	56
Fort Worth	2	4	2	8	0	3	1	0	0	0	40
Galveston	0	1	0	0	0	0	0	0	0	0	10
Houston	1	1	2	0	0	8	0	0	0	0	63
San Antonio	1	4	0	0	0	10	1	0	0	0	107
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	0	0	4	3
Great Falls	2	2	1	2	0	1	0	0	0	0	9
Helena	0	2	0	0	0	0	0	0	0	0	6
Missoula	1	1	0	1	0	1	0	0	0	0	7
Idaho:											
Boise	1	1	1	0	0	0	0	0	0	1	9
Colorado:											
Denver	15	12	2	0	0	7	0	0	0	8	83
Pueblo	1	4	0	1	0	0	0	0	1	0	12
Utah:											
Salt Lake City	3	6	1	2	0	1	0	0	0	8	32
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	3
PACIFIC											
Washington:											
Seattle	11	3	5	2			1	0		2	
Spokane	8	5	5	6			0	0		0	
Tacoma	3	4	4	2	0	1	0	0	0	0	24
Oregon:											
Portland	6	6	9	23	0	2	0	2	1	6	67
California:											
Los Angeles	31	32	6	4	0	37	2	0	0	18	269
Sacramento	2	4	1	1	1	0	0	1	0	2	21
San Francisco	15	37	5	0	0	7	1	1	0	21	143

City reports for week ended March 17, 1928—Continued

Division, State, and city	Meningococcous meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	22	9	1	0	0	0	1	0	1
New Jersey:									
Camden	0	0	1	1	0	0	0	0	0
Newark	1	0	1	0	0	0	1	1	0
Pennsylvania:									
Philadelphia	2	0	1	1	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	5	1	0	0	0	0	0	0	0
Toledo	0	0	1	0	0	0	0	0	0
Illinois:									
Chicago	14	5	0	0	0	0	0	0	0
Michigan:									
Detroit	2	0	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee	3	2	1	0	0	0	0	0	0
Racine	0	1	0	0	0	0	0	0	0
Superior	1	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	2	0	0	0	0	0	0	0	0
Missouri:									
Kansas City	4	0	0	1	0	0	0	0	0
St. Louis	6	3	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	1	0	0	0	0	0	0
Kansas:									
Topeka	0	0	0	1	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	0	0	0	0	0	0	0
North Carolina:									
Raleigh	0	0	0	0	0	1	0	0	0
South Carolina:									
Charleston	0	0	0	0	2	1	0	0	0
Georgia: [1]									
Atlanta	0	0	0	0	0	2	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	0	0	1	0
Louisiana:									
New Orleans	1	1	0	0	0	0	0	0	0
Texas:									
Dallas	0	0	0	0	1	1	0	0	0
Houston	2	1	0	0	0	0	0	0	0
San Antonio	0	0	0	0	0	1	0	0	0
MOUNTAIN									
Colorado:									
Denver	2	1	0	0	0	0	0	0	0
Pueblo	1	0	0	0	0	0	0	0	0
Utah:									
Salt Lake City	2	1	0	0	0	0	0	0	0
Nevada:									
Reno	0	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Tacoma	0	0	0	0	0	0	0	2	0
Oregon:									
Portland	0	0	0	1	0	0	0	0	0
California:									
Los Angeles	2	1	0	0	0	0	0	0	0
Sacramento	1	0	0	0	0	0	0	1	0

[1] Typhus fever: 1 case at Savannah, Ga.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended March 17, 1928, compared with those for a like period ended March 19, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, February 12 to March 17, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Feb 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928
101 cities	203	175	179	174	182	172	183	[2] 172	176	[3] 158
New England	133	172	149	138	163	140	128	145	137	[4] 136
Middle Atlantic	277	234	199	224	223	233	230	214	240	212
East North Central	168	160	198	169	176	164	165	171	157	135
West North Central	164	125	109	125	115	113	133	[5] 135	127	[5] 118
South Atlantic	191	149	191	156	105	130	155	124	141	139
East South Central	86	55	117	35	81	90	112	85	30	[6] 112
West South Central	170	124	194	188	149	92	190	168	161	136
Mountain	161	186	72	71	233	186	197	[7] 101	126	106
Pacific	188	82	151	161	133	141	198	171	165	125

MEASLES CASE RATES

	Feb 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928
101 cities	810	892	862	998	880	1,126	952	[2] 1,134	929	[3] 1,350
New England	181	1,657	228	1,908	172	1,979	198	1,657	212	[4] 2,277
Middle Atlantic	68	700	74	877	67	1,000	80	970	93	1,213
East North Central	1,009	531	1,015	565	1,173	761	1,169	865	1,283	1,063
West North Central	564	240	960	255	952	341	1,241	[5] 492	1,560	[5] 582
South Atlantic	792	2,246	651	2,406	794	2,576	783	2,784	1,010	2,972
East South Central	467	1,347	461	1,202	538	1,541	314	1,307	441	[6] 1,980
West South Central	562	1,899	591	1,959	720	1,695	1,187	1,300	1,026	1,328
Mountain	9,665	97	10,624	168	8,132	142	9,091	[7] 295	5,397	345
Pacific	2,774	692	2,865	749	3,030	892	3,252	904	2,923	830

SCARLET FEVER CASE RATES

	Feb 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928
101 cities	438	291	424	295	418	295	446	[2] 303	431	[3] 300
New England	470	441	542	414	423	347	591	377	546	404
Middle Atlantic	581	330	531	335	532	345	583	358	572	352
East North Central	322	280	366	285	399	309	369	292	353	296
West North Central	540	265	445	275	443	261	471	[5] 297	426	[5] 279
South Atlantic	249	228	218	282	180	254	193	268	230	223
East South Central	243	190	183	185	218	214	279	259	206	[6] 165
West South Central	66	116	116	120	66	96	120	128	62	208
Mountain	1,246	345	1,192	203	1,076	257	1,112	[7] 203	1,336	248
Pacific	340	230	313	233	329	194	285	192	253	217

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] Sioux City, Iowa, and Boise, Idaho, not included.
[3] Barre, Vt., Sioux City, Iowa, and Mobile, Ala., not included.
[4] Barre, Vt., not included.
[5] Sioux City, Iowa, not included.
[6] Mobile, Ala., not included.
[7] Boise, Idaho, not included.

Summary of weekly reports from cities, February 12 to March 17, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SMALLPOX CASE RATES

	Week ended—									
	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928
101 cities	33	20	25	24	21	17	30	[2] 23	31	[3] 21
New England	0	0	0	0	0	0	0	0	0	[4] 0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	28	12	15	13	21	18	34	14	33	26
West North Central	81	101	63	92	53	62	53	[5] 94	49	[5] 63
South Atlantic	60	26	45	26	52	19	54	25	51	33
East South Central	132	25	71	40	122	0	81	20	132	[6] 21
West South Central	62	20	50	8	50	20	70	36	45	44
Mountain	27	168	0	62	0	53	0	[7] 120	90	53
Pacific	94	18	104	125	13	49	94	69	84	88

TYPHOID FEVER CASE RATES

	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928
New England	2	5	9	7	2	0	12	2	5	[4] 7
Middle Atlantic	10	3	1	5	5	8	8	3	6	2
East North Central	4	3	6	1	6	7	1	4	4	3
West North Central	10	4	8	4	10	6	4	[5] 2	0	[5] 4
South Atlantic	23	7	29	9	23	12	11	9	11	11
East South Central	30	15	25	20	41	50	30	5	20	[6] 11
West South Central	8	12	4	16	8	32	17	4	12	12
Mountain	0	0	18	0	9	9	0	[7] 0	9	0
Pacific	3	8	8	5	8	8	10	3	18	5

INFLUENZA DEATH RATES

	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928
95 cities	23	22	22	21	25	24	27	[7] 22	31	[8] 25
New England	9	11	12	7	9	7	12	21	19	[4] 7
Middle Atlantic	25	18	22	24	24	16	25	19	31	26
East North Central	19	12	17	14	23	17	16	16	18	12
West North Central	23	6	10	2	17	10	14	12	21	16
South Atlantic	31	35	41	28	47	32	70	25	79	19
East South Central	43	37	43	31	21	84	80	55	90	[6] 73
West South Central	38	90	25	74	38	103	47	74	21	115
Mountain	27	71	54	35	54	88	54	[7] 64	18	80
Pacific	17	27	17	20	17	24	7	20	14	10

PNEUMONIA DEATH RATES

	Feb. 19, 1927	Feb. 18, 1928	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928
95 cities	146	174	163	161	171	190	188	[7] 191	184	[8] 221
New England	102	170	184	147	202	193	188	205	172	[4] 238
Middle Atlantic	148	195	176	155	193	217	222	221	226	268
East North Central	121	137	145	156	132	148	157	156	142	194
West North Central	91	94	91	71	104	106	81	96	114	139
South Atlantic	234	216	253	228	229	217	272	214	262	214
East South Central	175	204	122	220	271	240	186	312	191	[6] 331
West South Central	204	279	161	271	183	263	161	264	195	268
Mountain	188	168	134	248	126	265	170	[7] 276	161	208
Pacific	176	172	131	115	121	155	148	122	98	125

[2] Sioux City, Iowa, and Boise, Idaho, not included.
[3] Barre, Vt., Sioux City, Iowa, and Mobile, Ala., not included.
[4] Barre, Vt., not included.
[5] Sioux City, Iowa, not included.
[6] Mobile, Ala., not included.
[7] Boise, Idaho, not included.
[8] Barre, Vt., and Mobile, Ala., not included.

Number of cities included in summary of weekly reports, and aggregate populat of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,960

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended March 3, 1928.—The following report for the week ended March 3, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt —Suez.
Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Ceylon.—Colombo.

CHOLERA

India.—Bassein, Calcutta, Madras, Rangoon.
Siam.—Bangkok.
French Indo-China.—Saigon.

SMALLPOX

Aden Protectorate.—Perim.
Iraq.—Basrah.
Ceylon. - Colombo
India.—Bombay, Calcutta, Madras, Negapatam, Rangoon.
French India.—Pondicherry.
Dutch East Indies. - Bunjermasin, Belawan-Deli, Surabaya.
China.—Shanghai, Hong Kong.
Kwantung.—Dairen
Manchuria.—Mukden.

Returns for the week ended March 3 were not received from Samarinda, Dutch East Indies, or Vladivostok, Union of Socialist Soviet Republics.

ARABIA

Aden—Plague.—According to information dated February 29, 1928, 395 cases of plague with 244 deaths have been reported to that date at Aden, Arabia. The area of prevalence is stated to have extended beyond the point of original occurrence and to have reached a village 10 miles in the interior of the country. Isolated cases had been reported in the military and European residential areas, though no European had been attacked.

CANADA

Quebec Province—Communicable diseases—Week ended March 17, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended March 17, 1928, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Scarlet fever	106
Chicken pox	64	Smallpox	22
Diphtheria	44	Tuberculosis	58
German measles	12	Typhoid fever	20
Influenza	4	Whooping cough	26
Measles	339		

Vital statistics—Quebec Province—January, 1928.—Births and deaths in the Province of Quebec for the month of January, 1928, were reported as follows:

Estimated population	2,650,000	Deaths from—Continued.	
Births	6,255	Heart disease	327
Birth rate per 1,000 population	28.3	Influenza	68
Deaths	2,859	Measles	12
Death rate per 1,000 population	12.9	Pneumonia	299
Deaths under 1 year	757	Poliomyelitis	1
Infant mortality rate	121.0	Scarlet fever	15
Deaths from—		Smallpox	0
Accidents	38	Syphilis	7
Cancer	145	Tuberculosis (pulmonary)	213
Cerebrospinal meningitis	10	Tuberculosis (other forms)	37
Diabetes	26	Typhoid fever	30
Diarrhea	109	Whooping cough	38
Diphtheria	57		

FINLAND

Communicable diseases—January, 1928.—During the month of January, 1928, communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	91	Paratyphoid fever	20
Dysentery	15	Poliomyelitis	1
Encephalitis lethargica	1	Scarlet fever	166
Influenza	2,923	Typhoid fever	31

Population: 3,558,220.

GREAT BRITAIN

Bristol, England—Vital statistics—1927.—During 1927, 5,023 deaths were reported at Bristol, England, the general death rate being 13.1 per thousand, as compared with a rate of 11.9 per thousand in 1926. The birth rate in 1927 was 17.0 per thousand. In 1926 it was 17.7. The infant mortality rate in 1927 was the lowest ever recorded in Bristol, 57 per thousand births.

UNION OF SOUTH AFRICA

Orange Free State—Suspect plague.—During the week ended February 11, 1928, three suspect fatal cases of plague were reported in natives in the Heilbron District, Orange Free State, Union of South Africa, on a farm.

Typhoid fever.—Under date of February 24, 1928, an outbreak of typhoid fever was reported in the native female section of the Mental Hospital, Pietermaritzburg, Natal, with 20 cases and 2 fatalities. The outbreak was attributed to a carrier among the patients.

At Vrede, Orange Free State, a mild outbreak of the disease was reported, with 36 cases in the town and native location occurring since December 24, 1927. The mild character of the epidemic was attributed to the extensive inoculation against the disease carried out two years ago on the occasion of an outbreak of typhoid fever in the same locality.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Week ended— December, 1927: 24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	Mar. 3, 1928
China:																		
Amoy	C	2	28	72	16													
	D		7	3														
Canton	C	8	31	36	14	12	1											
	D	5	16	25	14	11	1											
Foochow	C	P	P	P	P													
Hong Kong	C	2	P	1	P													
	D	1																
Shanghai (settlement and concession)— Foreigners only	C		1	6	3													
Including natives	D		20	74	7													
Swatow	C	72	42	P	P	P												
	D	1		P	P	P												
Tientsin	C	P	P	15	2	P	1											
Dutch East Indies: Java—Batavia	C					28	3											
	D					18	3											
India	C	46,137	45,163	31,390	20,160	23,047	25,139	4,624	3,960	3,550	3,243	3,267	3,097					
	D	24,081	22,051	15,895	10,371	12,863	15,026	2,617	2,353	2,046	1,847	1,765	1,739					
Bassein	D	16												1			1	1
Bombay	C	75	42	3		2							1					
	D	35	30	2		2												
Calcutta	C	95	87	76	101	199	428	69	42	43	22	39	36	70	58			
	D	48	40	39	64	138	281	48	34	27	16	18	24	38	32	35	42	36
Madras	C	424	547	59	14	13	1				1	1			1		3	
	D	204	278	48	8	7	2				1		3		1	2	2	7
Madras Presidency	C	11,491	7,660	3,056	2,050	3,073	3,702	503	382	482	497	1,163	1,301					
	D	4,807	3,513	1,581	1,055	1,736	2,104	241	209	254	280	623	813					
Negapatam	C											4						
	D											4			1	2	2	
Rangoon	C	2	1	2	6	2	8	1	2		1	4	1	1	1	10		
	D	2	1	2	5	5	6	1	1		1			1	1	8	4	2
Tuticorin	C				1		8											
	D				1	37	14											

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths, P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Week ended— December, 1927: 24	December, 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	Mar. 3, 1928
India (French):																		
Chandernagor	C	1	1	1		6	10	6	3	4	1	1		5				
	D	1	1			6	10	4	2	2	1			1				
Karikal	C	56	18	1		1	1			6	2	9	7	8				
	D	45	12	1		1	1			4		5	4	5				
Pondicherry	C	37	12	15		1	25	4	1	2	4	2	3	2				
	D	24	11	15		1	21	6	1	2	3	2	3	2				
Indo-China: Saigon	C			1	1					2	1	1	1		2	1	5	
	D									1					1	1	1	
Iraq [1]																		
Japan: Yokohama	C	1																
	D	1																
Philippine Islands: Manila	C	1	1															
Siam	C	81	77	40	18	110	88	24	24	13	49	50	33	48	69			
	D	59	53	24	11	76	64	18	21	5	36	34	21	42	42			
Bangkok	C	6	2	3	5	4	3	2	3	7	9	11	28	28	34	23	17	12
	D	1	1	1	3	2	2	2	1	3	5	7	16	26	17	12	11	7
Straits Settlements: Singapore	C					7	5	3	15	3	2	2			1			
	D					5	4	1	4	5	2	1						
On vessel:																		
S. S. Adrastus: At Yokohama, Japan	C		1															
	D		1															
S. S. Tabaristan: At Basra, Iraq	C				1													

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927: 1-10	November, 1927: 11-20	November, 1927: 21-30	December, 1927: 1-10	December, 1927: 11-20	December, 1927: 21-31	January, 1928: 1-10	January, 1928: 11-20	January, 1928: 21-31	February, 1928: 1-10	February, 1928: 11-20	February, 1928: 21-29
Indo-China (French):																	
Annam	C	911	1,628	640	226	13	75	38	16	2		79	95	98	23	36	14
Cambodia	C	87	89	75	180	56	1	28	21	12	39	30	9	15	38	22	51
Cochin-China	C	257	68	144	178	21	27	52	17	38	58	46	119	180	178	118	153
Laos	C	20	190	36	67	10											
Tonkin	C	1,093	180	24	1			1			2	1					
Kwangchow-wan	C		1	15													

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927: 24	December, 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17
Algeria: Oran	C	4	1		2														
	D	3	1																
Arabia: Aden	C									19	13	22	54	89	63	45	77	158	
	D									7	8	8	33	55	50	31	26	99	
Argentina:																			
Bahia Blanca district	C					3													
Buenos Aires	C													2					
Cordoba Province	C	2		P	P	10	1	1											
Entre Rios	C	5																	
Firmat	C					1													
Quilino	C					3													
Rosario	C					4	2	3				4			1				
Santiago Province	C														1				
Ucacha	C					1													
Azores: St. Michaels Island	C	2	2	3	3	3	1		1		3	1	2	2					
	D		1	1		1				1	1	1	1	1					
Brazil:																			
Bahia	C							1	2	1	2		2	1	4				
	D							1	1	2		1	2	1	2				
Porto Alegre																	2		
Rio de Janeiro	C										1		1	2	1	1			
	D													1	2				
British East Africa:																			
Tanganyika	C	P		P	P	P	P						2						
Uganda	C	456	226	99	99	67													
	D	345	158	88	96	61													
Canary Islands:																			
Las Palmas	C			9		3			2	1	1				1				
	D					1				1	1				1				
Teneriffe	C										1	3	3	3					
	D										1		3						
Ceylon: Colombo	C	1	3	1		6	3	2	1	1	1	1	1		3	3	4	1	
	D		3			6	3	1	1	1	1	1			1	3	1	1	

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927: 24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	March, 1928: 3	10	17
China:																			
Tientsin	C	2																	
Tungliao	D			200															
Dutch East Indies:																			
Balik-Papan	C						1												
	D						1												
Celebes—Makassar	C				6	2	2	1		3	2	1	1	1		1			
	D				6	2	2	1		2	2	1	1	1		1			
Java	D		432	779	829	1,017	209	179	176	187									
Batavia and West Java	C	71	68	130	132	154	32	36	24	36	46	37	27						
	D	71	68	129	132	152	32	36	24	36	44	37	27						
Cheribon	C					1													
	D					1													
East Java and Madura	C	28	18	17	10	8	3	2	1	1	5	2					P		
	D	27	18	17	10	8	3	2	1	1	5	2							
Pasoeroean Residency	C					P													
Surabaya Residency	C					P													
Surakarta Residency	C				P	P													
Egypt:																			
Alexandria	C	2	1			12	3	2					1		1				
	D					7	1	1					1		1				
Suez	C		1							1	1		3		3	4		3	
	D									1	1		1		3	3	2	1	
Greece:																			
Athens and Piraeus	C	1	3	1				2	1										
	D			1				1											
Mitylene	C	1	5	1	3	3													
Patras	C	2	2	1	1														
	D			1	1														
Hawaii Territory: Hawaii	D	1													1				
India	C	1,391	2,710	3,246	3,600	5,518	1,085	1,197	2,596	2,219	2,544	2,699							
	D	836	1,428	1,792	2,065	3,269	733	899	1,804	1,498	1,653	1,661							
Bassein	D	12	14	8	4	4	2	13	2		3	3		2	1	2	4	5	
Bombay	C	14	7	4				1		2	5	4	2	3	5				
	D	11	5	3				1		1	2	2	3	2	6	14	7	6	

Calcutta	C		18																
	D		10									1							
Madras Presidency	C	620	465	583	470	791	174	167	56	153	107	132	79						
	D	321	230	298	282	359	69	27	38	72	63	64	60						
Rangoon	C	15	6	11	11	15	2	4	4	7	8	9	7	11	15				
	D	14	6	11	11	15	2	3	4	7	7	7	6	10	12	15	6	10	
Indo-China: Saigon	C		2		1														
Iraq:																			
Baghdad	C										1	1		2		1			
	D										1			1		1	1		
Dulaim Liwa	C												1						
Nigeria: Lagos	C				17	13	2	1	1	6	2	3	3	2	2	3	2		
	D				17	13	1	1	1	5	3	3	3	2	2	3	2		
Senegal: [1]																			
Baol	C	23	72	95	P	P													
	D	13	33	40															
Cayor	C	227	463	176	48														
	D	166	233	88	28														
Dakar	C	46	20	1															
	D	32	12																
Louga	C		5	8															
	D		4																
Rufisque	C	44	16																
	D	38	12																
Thies	C		9	1	1														
	D		7																
Siam	C			13	1	3	1	7	4	4	5	3	6						
	D			9		2	1	1	5	4	1	1	5						
Bangkok	C			2				1				1	1		1				
	D				1			1				1	1		1				
Straits Settlements: Singapore	C				1								1	1	1		1		
	D				1								1	1	1				
Tunisia [2]																			
Turkey: Constantinople	C		1	1		2													
	D			1		1													
Union of South Africa:																			
Cape Province	C				2	2					1								
	D				2	1					1								
Orange Free State	C				1	8						2		3					
	D				1	6						1		3					
U. S. S. R.:																			
Chita district	C			1															
	D			1															
Northern Caucasus	C		14	1															
	D		10																
Venezuela: State of Miranda—Tacata and Cua	C																		P
On vessel:																			
At La Plata, from Rosario, Argentina	C							1											
S. S. Aghios Gerasimos at, Vigo Spain	C				3														

[1] During January, 1928, 5 cases of plague were reported in interior of Senegal
[2] Eight cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July	August	September	October	November	December	January
Algeria: Algiers	C				2			
British East Africa: Kenya	C	13	61	21	18	28	16	26
Ecuador: Guayaquil	C	5	7	3	4	9	5	4
	D					3	2	4
Indo-China (French)	C			14	3	3	4	7
Madagascar	C	46	98	170	166	209	317	427
	D	43	89	154	155	189	281	388
Ambositra Province	C	6	1		6	1	18	105
	D	6	1		6	1	10	96
Antsirabe Province	C		34	5	19	18	72	117
	D		34	4	19	17	72	117
Itasy Province	C	14	11	21	16	26	62	33
	D	14	7	20	15	25	54	29
Moramanga Province	C	5	4	3	24	46	25	19
	D	5	4	3	20	41	22	19
Madagascar—Continued								
Tananarive Province	C	21	48	142	99	170	139	155
	D	19	43	127	98	153	108	129
Mauritius	C			1				
Nigeria	C	9	8	15	27	16	20	16
	D	7	8	14	27	16	18	16
Peru	C	8	11	15	14	6	14	
	D	7	6	6	5	2	4	
Callao	D	3					3	
Lima	C						7	
	D				1	1	1	
Syria: Beirut	C						2	

SMALLPOX

[C, indicates cases; D, deaths, P, present]

Place		July 31–Aug 27, 1927	Aug. 28–Sept 24, 1927	Sept. 25–Oct 22, 1927	Oct 23–Nov. 19, 1927	Nov 20–Dec 17, 1927	Week ended— December, 1927: 24	Dec. 31	January, 1928: 7	Jan. 14	Jan. 21	Jan. 28	February, 1928: 4	Feb. 11	Feb. 18	Feb. 25	March, 1928: 3	Mar. 10	Mar. 17
Algeria	C	459	382	683	661	170	81	26	7	15	17	18	11						
Algiers	C					3	3	4		2	3	1	7	4	4				
Oran	C	9	16	11	20	39	8	15	2	4	2	2	4		1		2		
Arabia: Aden	C				1	3	1								1				
Brazil:																			
Para	C	1																	
Rio de Janeiro	C	6	10		1														
	D	4	9		1														

British East Africa: Tanganyiki	D	21	8	P	P	P			2	6	4								
British South Africa:																			
Northern Rhodesia	C	55	39	164	185	252	2	81	141	12	3		230						
	D	1	2	11	64	62		8	23				23						
Southern Rhodesia	C				3	2	1						P	3	2				
Canada:																			
Alberta	C	17	17	23	10	19		3	3	5	1	19	1	6		3		7	
Calgary	C	1																	
Edmonton	C			1	1	8			3	2	1			2	1		11	1	
British Columbia: Vancouver	C		2			4	1	3	3	1	11	3	1	11	2	1		1	1
Manitoba	C	13	9	7	19	7	2	2	2	5		1							
Winnipeg	C	5	4	2	2	2	1			1	1	1							
New Brunswick	C		2				1									1			
Nova Scotia	C		1	1															
Halifax	C			1															
Ontario	C	60	22	96	264	347		53	83	76	52	77	63	51	40	51	36	20	
Hamilton	C					2													
Kingston	C				1		1							1					
Ottawa	C	27	40	67	134	63	18	9	10	23	20	16	23	9	11	3	1	7	6
Toronto	C		2	10	34	39	7		11	10	8	5	1	6	4	4	2	4	2
Windsor	C			9															
Quebec	C	1		8	25	16	14	3	10	17	7		11	8	11	13		18	
Montreal	C				1		1		1	6	3	4	1		5	1	3		
Quebec	C					4		2		3		5				2	3		
Riviere du Loup	C				3														4
Saskatchewan	C	14	68	31	34	58	12	13	15	12	39	15	9	34	7	8		7	
Moose Jaw	C	10	16	3		1		1	2	1	4	2	3	2		2	6	5	2
Regina	C	8		5	1	1													
Saskatoon	C					2		4			13	1		1		2			
Ceylon: Colombo	C	1			1	2					1		1	2	2	1	3		
	D	1				1					1								
China:																			
Antung	C									1									
Canton	C		1																
	D		1																
Chefoo	C		1	P		P													
	D		1																
Foochow	C	P	P	P	P	P	P	P		P		P		P					
Hong Kong	C	1	2							1	1					3		8	
	D	1	2						1			1				1	1	2	
Manchuria—																			
Changchun	C					1						4							
Dairen	C			1	2	1			2	3					1				
	D			1															
Fushun	C		1		1														
Harbin	C					2		1				2							
Mukden	C			2	1							1		3	18		3		
Pensihu	C			1															
Shanghai—																			
Foreigners only	C										1	2		2	1				
Including natives	D										3	2	3	3	5	4	4	6	
Tientsin	C		4	13	8	9	2			6	20	10	10	8	5				
Curacao (alastrim)	C										2				3				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927: 24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	March, 1928: 3	10	17
Dutch East Indies:																			
Borneo—																			
Samarinda District	C				P														
South and East Borneo Residency	C	P																	
Java—																			
Batavia and West Java	C	4		4	25								1						
	D				15														
East Java and Madura	C	4	22	8	9	9		3	1	1	2								
	D			1															
Sumatra: Medan	C					3		8		1	3	5	5	10					
	D					2		1		2	4	4		3					
Egypt	C		3			4		4											
	D		1	1		1													
Cairo	C					2													
Great Britain:																			
England and Wales	C	568	508	473	902	1,041	255	247	275	398	405	370	386	369	369	392	365	347	
Birmingham	C	1		1							14	17	11	2	1		2		
Bradford	C				11	19	2	2	4	24	6	9	7	2	7	1		4	
Bristol	C			6	4	8						2		1			1	3	
Cardiff	C				1				1										
Leeds	C	5	3	7	5	16	4	6	1		1			2	1	2	4	2	
Liverpool	C									1								1	
London	C										2		1	5	10	1	2	1	
Manchester	C			3	6	25		1	2	2	11	6	4	4	1	4	1	2	
Newcastle on Tyne	C	1	2	6	9	55	2	13	2	5	14	3	4	6	4	1	4	3	
Nottingham	C								7	6	4	8	6	9	6	1	3	1	
Sheffield	C	2	1	10	6	9	3		1	10	4		4		1	2	2	1	
Stoke on Trent	C	1							3	1			1		2	4	3	6	
Greece: Saloniki	D	2																	
India	C	5,911	4,398	3,153	4,052	6,731	2,225	2,502	2,664	3,285	4,129	3,631							
	D	1,668	1,120	715	927	1,650	515	578	551	785	964	803							
Bassein	C	1												1					
	D	1																	

Bombay	C	33	12	10	4	9		4	4	6	10	23	10	18	29	23	40	51	
	D	19	8	2	3	2					2	8	7	7	15	13	23	22	
Calcutta	C	27	22	5	5	25		17	9	14	14	11	23	10	9	18	14	30	
	D	25		6	2	11		17	4	6	10	7	10	7	5	11	10	24	
Madras	C	6	7	8	7	11	2		11	8	9	16	20	29	15	33	21	31	
	D		2		2	3	1		4	1	3	2	2	1	3	3	3	10	
Negapatam	C	3	1							5		4	2	2	1		1	1	
	D	2	1							3		2	1						
Rangoon	C	14	9	17	6	14	36	28	23	49	41	34	103	97	68	82	132	95	
	D	3	2	3	1	4	5	13	4	9	13	10	18	23	22	24	26	32	
Vizagapatam	C		3						3		2	1	5	2		1		1	
	D		2								6	1		1					
India (French):																			
Karikal	C	3	1	2	P														
	D	3	1	2															
Pondicherry	C	39	37	38	42	41	6	16	25	18	15	17	15				6	3	
	D	31	37	38	42	41	6	14	12	18	15	17	15				6	3	
Indo-China: Saigon	C	1	1			1		1	1	1								1	
Iraq:																			
Baghdad	C		1	7	5	25	9	9	3	2	7	6	5	3					
	D		1	4	4	14	7	3	2		3	3	2	1					
Basra	C	1	4	2	3	4		2			1						2	4	
	D	1	4	2	1	3		1											
Italy (Rome and vicinity)	C		1				2												
Jamaica (outside Kingston) (alastrim)	C	6	9	9	7	3		2				4	1		1	3			
Kingston	C		3	2															
Japan:																			
Nagasaki	C	2																	
	D	1																	
Tokyo	C										2	1		1					
	D											1							
Mexico:																			
Acapulco	C		2		1														
	D		2		1														
Chihuahua	D								1										
Guadalajara	D					2											1		
Manzanillo	D									1								1	
Mexico City and surrounding territory	C					4							1	1	2				
Monterey	C																		
	D																		
San Luis Potosi	D	1																	
Tampico	C															1			
Torreon	D	1		2															
Palestine: Jerusalem	C					1						1							
	D											1							
Poland	C	2				1	5	1			1	1	1						
	D	1																	
Porto Rico	C																		P
Portugal:																			
Lisbon	C		3	8	4	10	1	2	4	5	5	2	2	3	3	9			
	D					1													
Oporto	C		1																
Senegal: Dakar	C															8			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927: 24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	March, 1928: 3	10	17
Siam	C	51	27	6	1	9	2	5	8	8	13	7	5	10					
	D	10	15			1			2		1	1	2						
Bangkok	C		3		1	1		1	2										
	D		1						1										
Spain:																			
Malaga	D				1	1													
Seville	C									1									
Valencia	C			1				1	1									1	
Straits Settlements: Singapore	C				1									1					
Switzerland	C						2												
Tunisia: Tunis	C							2	2			3			2	4			
Union of South Africa:																			
Cape Province	C	P		P							P								
Orange Free State	C	P			P	P	P				P								
Transvaal	C			P	7														
Venezuela: Maracaibo	D		2	1										1					

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927: 1–10	11–20	21–30	December, 1927: 1–10	11–20	21–31	January, 1928: 1–10	11–20	21–31	February, 1928: 1–10	11–20
Algeria	C	376	459	332	682											
Oran	C	14	10	16	11											
Indo-China	C	19	3	21	25	13	3	22	10	4	20		40	18	50	31
Syria:																
Aleppo	C										1		1			
Beirut	C								1		1			15	11	26
Damascus	C		3	5	22		13		4	6	2	11	2			

Place		July-Sept.	October	November	December	January	February
Angola	C	51	73	71			
	D		2				
Congo	C	5	77				
Cuanza-Norte	C	1					
Cuanza-Sul	C		2				
Loanda	C	1					
Zaire	C	3	4	1			
Brazil: Porto Alegre	C	11	4	1			
British East Africa: Zanzibar	C		2				
	D		1				
Chosen	C	21	2	2			
	D	6		1			
Ecuador: Guayaquil	C	4	1	1	4	2	9
France	C	37	7	4	14	11	
Gold Coast	C	7	4				

Place		July-Sept.	October	November	December	January	February
Greece	C	10	4		5	6	11
Latvia	C		2				
Mexico	D	221		157			
Morocco	C	180	81	140	401	55	
Nigeria	C	820	223	93			
	D	173	51	30			
Persia	D			2			
Spain: Madrid	D			1			
U. S. S. R.:							
Railways, etc	C	26	7	11			
Other territories in Europe	C	366	220				
Transcaucasus, Siberia, and Central Asia	C	80	40	21			
Ukraine	C	27	11	20			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— Dec., 1927: 24	Dec., 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	Mar., 1928: 3	Mar., 1928: 10
Algeria:																		
Algiers	C											1						
Oran	C						1	1	1	1		2			2		6	
Austria: Vienna	C												1					
Bulgaria: Sofia	C			17	6	1	1	4	1		1							
	D				1													
Chile:																		
Antofagasta	D			1														
Valparaiso	C		1		1	2				1								
	D	2	1		2													
China:																		
Manchuria—Harbin	C	2			1													
Tientsin	C		2															
Egypt	C	2		12	4	11	1		3	4	2			1				
	D	3		5		8			3	1								
Cairo	C					2												
	D					1												
Port Said	C			1		1												
Ireland (Irish Free State):																		
Cork County	C					3			1									
Donegal County, Letterkenny	C			4														
Mexico:																		
Guadalajara	D					1												
Mexico City, including municipalities in Federal District	C	17	19	18	23	17	4	4	4	3	2	1		2	1		4	3
	D				2	1	1	3	1								3	1
Morocco	C								107	235	257	214	370	210				
Palestine	C	11	1	5	3	9				8		2	2	1	1			
Poland	C	50	35	19	64	93	26	33	68	68	101	92	87	66	57			
	D	6	2	4	11	10	1	3	6	6	4	3	5	7	10			
Portugal: Oporto	C	1			1									1				
Rumania	C	36	16	17	22	35	32	17	19				15	24				
	D	1		2				2	1				2	7				
Syria: Aleppo	C		2						2									

Place																		
Tunisia	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]				[illegible]			
Union of South Africa:																		
Cape Province	C	P	P	P	P	P	P	1	P		P	P	1	P				
Natal	C	P	P	P	P	2	2	P	P	1		P		1				
Orange Free State	C			P		P							P	P				
Transvaal	C	1		5	P	P												

Place		1927 July	August	September	October	November, 1927 1-10	11-20	21-30	December, 1927 1-10	11-20	21-31	January, 1928 1-10	11-20
Algeria	C	67	33	10	12								
	D	13			1								
Algiers	C	2	2	6	2								
Bulgaria	C	12	24	7	2						2	7	6
	D		1	2	1						1		1
Morocco	C	148	76	7	11	5	14	7	5	6	75		

Place		July-Sept.	October	November	December	January	February
Argentina	C			1			
	D				1		
China: Shanghai	D			1			
Chosen	C	90	16	26	38		
	D	8	1	2	3		
Chemulpo	C	3				1	
Gensan	C	2				1	
Seoul	C	5	2				
	D	1	1				
Czechoslovakia	C	12	1		6		
Greece: Athens	C	3			1		2
Japan	C	1		1			
Latvia	C	6					

Place		July-Sept.	October	November	December	January	February
Lithuania	C	69	9	18	27	86	
	D	14	1	1	1	10	
Mexico	D	64	36	29			
Peru:							
Arequipa	D	3	2		1	2	
Lima	D	8					
U. S. S. R.:							
Railways, etc.	C	77	23	33			
Transcaucasus, Siberia, and Central Asia	C	208	61	49			
Ukraine	C	295	151	198			
Other territories in Europe	C	1,839	521				
Yugoslavia	C	20	1	1		7	
	D	5				3	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D. deaths, P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927 5	12	19	26	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	Feb. 4, 1927
Ashanti: Obuasi	C		1																	
	D		1																	
Belgian Congo:																				
Boma	C														3					
	D														2					
Matadi	C														6	12	11	1	5	8
	D														2	6	8	2	5	6
Dahomey:																				
Grand Popo	C									1										
	D									1										
Porto Novo	C	1																		
	D	1																		
Ivory Coast	C	1												1						
	D	1												1						
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	9	16	6	6	7										
	D	3	9	21	31	8	10	4	4	6										
Dakar	C	1			12	3	6		5	2	1	4			1	1				
	D				7	2	4		4	2	1	4			1	1				
Togoland	C		1																	
	D		1																	

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

×

TREASURY DEPARTMENT

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ISSUED WEEKLY

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SPECIAL ARTICLES

Rural Health Service in the United States, 1924-1928
A Study of the Effect of Salt on Sludge Digestion
Test for Phenolic Tastes and Odors after Chlorination

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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EXTENT OF RURAL HEALTH SERVICE IN THE UNITED STATES, 1924–1928

By L. L. LUMSDEN, *Senior Surgeon, United States Public Health Service*

According to data obtained by the Rural Sanitation Office of the Public Health Service from the health departments of the States, the following (Table 1) is a list, by States, of counties (or districts) in which the rural sections thereof at the beginning of the calendar years 1924, 1925, 1926, 1927, and 1928, respectively, were provided with local health service under the administration of whole-time county or (local) district health officers.

TABLE 1.—*List of counties or districts in which, as of January 1, 1924, 1925, 1926, 1927, and 1928, respectively, rural sections were provided with health service under whole-time local health officers*

1924	1925	1926	1927	1928
		ALABAMA		
Baldwin	Baldwin	Baldwin	Baldwin	Baldwin
Barbour	Barbour	Barbour	Barbour	Barbour
Calhoun	Calhoun	Calhoun	Calhoun	Calhoun
Colbert	Colbert	Coffee	Chambers	Chambers
Covington	Covington	Colbert	Coffee	Coffee
Dallas	Dallas	Covington	Colbert	Colbert
Escambia	Escambia	Dallas	Covington	Covington
Etowah	Etowah	Escambia	Dallas	Cullman
Franklin	Franklin	Etowah	Escambia	Dale
Houston	Houston	Franklin	Etowah	Dallas
Jefferson	Jefferson	Houston	Franklin	Elmore
Lauderdale	Lauderdale	Jackson	Houston	Escambia
Limestone	Limestone	Jefferson	Jackson	Etowah
Madison	Madison	Lauderdale	Jefferson	Franklin
Mobile	Marengo	Lawrence	Lauderdale	Houston
Montgomery	Marshall	Lee	Lawrence	Jefferson
Morgan	Mobile	Limestone	Lee	Lauderdale
Pike	Montgomery	Madison	Limestone	Lawrence
Sumter	Morgan	Marengo	Madison	Lee
Talladega	Pike	Marshall	Marengo	Limestone
Tuscaloosa	Sumter	Mobile	Marshall	Madison
Walker	Talladega	Montgomery	Mobile	Marengo
	Tuscaloosa	Morgan	Montgomery	Marshall
	Walker	Pike	Morgan	Mobile
		Sumter	Pike	Monroe
		Talladega	Sumter	Montgomery
		Tuscaloosa	Talladega	Morgan
		Walker	Tallapoosa	Pike
			Tuscaloosa	Sumter
			Walker	Talladega
				Tallapoosa
				Tuscaloosa
				Walker
		ARIZONA		
	Cochise	Cochise	Cochise	Cochise
			Yuma	Coconino
				Yuma

TABLE 1.—*List of counties or districts in which, as of January 1, 1924, 1925, 1926, 1927, and 1928, respectively, rural sections were provided with health service under whole-time local health officers*—Continued

1924	1925	1926	1927	1928
		ARKANSAS		
		Garland Jefferson Pulaski	Garland Jefferson Pulaski	Arkansas Ashley Chicot Conway Crittenden Cross Desha Drew Garland Jackson Jefferson Little River Mississippi Monroe Phillips Pope Pulaski Saline Union Woodruff Yell
		CALIFORNIA		
Los Angeles Monterey Orange San Joaquin San Luis Obispo	Los Angeles Monterey Orange San Diego San Joaquin San Luis Obispo	Los Angeles Monterey Orange San Diego San Joaquin San Luis Obispo Santa Barbara	Los Angeles Monterey Orange Riverside San Diego San Joaquin San Luis Obispo Santa Barbara Yolo	Los Angeles Monterey Orange Riverside San Diego San Joaquin San Luis Obispo Santa Barbara Yolo
		COLORADO		
		Otero	Otero	Otero
		CONNECTICUT		
	Fairfield[1]	Fairfield[1]	Fairfield[1]	Fairfield[1]
		FLORIDA		
		Polk	Manatee Polk Sarasota	Manatee Polk Sarasota

[1] District

TABLE 1.—*List of counties or districts in which, as of January 1, 1924, 1925, 1926, 1927, and 1928, respectively, rural sections were provided with health service under whole-time local health officers*—Continued

1924	1925	1926	1927	1928
		GEORGIA		
Baldwin. Bartow. Bibb. Clarke. Cobb. Decatur. De Kalb. Dougherty. Floyd. Glynn. Hall. Laurens. Lowndes. Mitchell. Richmond. Sumter. Thomas. Troup. Walker.	Baldwin. Bartow. Bibb. Clarke. Cobb. Decatur. De Kalb. Dougherty. Floyd. Glynn. Hall. Laurens. Lowndes. Miller. Mitchell. Richmond. Seminole. Sumter. Thomas. Troup. Walker.	Baker. Baldwin. Bartow. Bibb. Clarke. Cobb. Decatur. De Kalb. Dougherty. Floyd. Glynn. Grady. Hall. Laurens. Lowndes. Mitchell. Richmond Sumter. Thomas. Troup. Walker. Ware.	Baker. Baldwin. Bartow. Bibb. Brooks. Clarke. Cobb. Decatur. De Kalb. Dougherty. Floyd. Glynn. Grady. Hall Laurens. Lowndes. Mitchell. Richmond. Spaulding Sumter. Thomas. Troup. Walker. Ware.	Baldwin. Bartow. Bibb. Brooks. Chatham. Clarke. Cobb. Coffee. Colquitt. Crisp Decatur. De Kalb Dougherty. Floyd. Glynn. Hall Laurens. Lowndes. Mitchell. Richmond. Spaulding. Sumter. Thomas Troup. Walker Ware Washington.
		ILLINOIS		
Morgan.	Cook. Crawford. Morgan. Sangamon.	Cook. Morgan. Sangamon.	Cook. Morgan Sangamon	Cook. Du Page. Morgan.
		IOWA		
Dubuque. Washington.	Dubuque. Washington.	Dubuque.	Dubuque.	
		KANSAS		
Butler. Cherokee. Ellis. Geary. Lyon. Marion. Ottawa. Sheridan.	Cherokee. Geary. Lyon. Marion. Ottawa. Sheridan.	Butler Coffey. Ellis. Geary. Jefferson. Lyon Marion. McPherson. Ottawa. Phillips.	Butler. Coffey. Ellis. Geary. Jefferson. Lyon. Marion. Ottawa. Phillips.	Butler Cherokee. Ellis Geary. Greenwood. Jefferson. Lyon. Marion. Ottawa. Shawnee.

TABLE 1.—*List of counties or districts in which, as of January 1, 1924, 1925, 1926, 1927, and 1928, respectively, rural sections were provided with health service under whole-time local health officers*—Continued

1924	1925	1926	1927	1928
		KENTUCKY		
Bell	Boyd	Boyd	Boyd	Ballard
Boyd	Daviess	Daviess	Daviess	Boyd
Daviess	Fayette	Fayette	Fayette	Breathitt
Fayette	Fulton	Fulton	Fulton	Carlisle
Fulton	Jefferson	Jefferson	Jefferson	Carter
Jefferson	Johnson	Johnson	Johnson	Daviess
Johnson	Mason	Mason	Knott	Elliott
Mason	Scott	Scott	Mason	Estill
Scott			Scott	Fayette
				Floyd
				Fulton
				Henderson
				Hickman
				Hopkins
				Johnson
				Knott
				Lawrence
				Lee
				Leslie
				Letcher
				Magoffin
				Martin
				Mason
				McLean
				Menefee
				Morgan
				Owsley
				Perry
				Pike
				Scott
				Webster
				Wolfe
		LOUISIANA [2]		
Beauregard	Beauregard	Caddo	Caddo	Assumption
Caddo	Caddo	Claiborne	Claiborne	Avoyelles
Claiborne	Claiborne	De Soto	De Soto	Caddo
De Soto	De Soto	Lafourche	Lafourche	Caldwell
Natchitoches	Natchitoches	Natchitoches	Natchitoches	Catahoula
Ouachita	Ouachita	Ouachita	Ouachita	Claiborne
Rapides	St Mary	Plaquemines	Plaquemines	Concordia
St Mary	Tangipahoa	St Mary	St Mary	De Soto
Tangipahoa	Washington	Tangipahoa	Washington	East Carroll
Washington		Washington	Webster	Franklin
		Webster		Iberia
				Lafayette
				Lafourche
				La Salle
				Madison
				Morehouse
				Natchitoches
				Ouachita
				Plaquemines
				Rapides
				Richland
				St Martin
				St Mary
				Tangipahoa
				Tensas
				Washington
				Webster
				West Carroll
		MAINE		
Oldtown	Oldtown	Oldtown	Oldtown	Motbov Union [3]
Rumford	Rumford	Rumford	Rumford	Rumford [4]
Sanford	Sanford	Sanford	Sanford	Sanford [4]
Waterville	Waterville	Waterville	Waterville	Vassalboro [4]
York	York	York	York	

[2] Parishes

[3] Including towns of Orono, Milford, Bradley, and Veazie

[4] Town (township), wholly or partly rural

TABLE 1.—*List of counties or districts in which, as of January 1, 1924, 1925, 1926, 1927, and 1928, respectively, rural sections were provided with health service under whole-time local health officers*—Continued

1924	1925	1926	1927	1928
		MARYLAND		
Allegany. Frederick. Montgomery.	Allegany. Baltimore. Calvert. Carroll. Frederick. Montgomery.	Allegany. Baltimore. Calvert. Carroll. Frederick. Montgomery.	Allegany. Baltimore. Calvert. Carroll. Frederick. Montgomery.	Allegany. Baltimore. Calvert. Carroll. Frederick. Montgomery. Prince George. Talbot.
		MASSACHUSETTS		
Cape Cod.[1]	Cape Cod.[1]	Cape Cod.[1]	Cape Cod.[1]	Barnstable.[2]
		MINNESOTA		
St. Louis.	St. Louis.	St. Louis.	St. Louis.	St. Louis.
		MISSISSIPPI		
Bolivar. Coahoma. Forrest. Harrison. Hinds. Jones. Lauderdale. Lee. Tallahatchie. Washington.	Bolivar Coahoma. Forrest. Hancock. Harrison. Jackson. Jones Lee Pearl River. Sharkey Washington.	Bolivar. Coahoma. Forrest. Hancock. Harrison. Hinds Jackson. Jones. Lee. Leflore Pearl River. Sharkey. Washington.	Bolivar. Clarke. Coahoma Forrest Hancock Harrison. Hinds Holmes Jackson Jones. Lamar. Lee. Leflore Pearl River. Perry. Sharkey. Union. Washington.	Bolivar. Clarke Coahoma. Forrest Hancock. Harrison Hinds Holmes Humphreys. Issaquena. Jackson Jones. Lamar. Lee. Leflore. Pearl River. Perry. Sharkey Sun Flower. Tishomingo. Union. Warren. Washington. Yazoo
		MISSOURI		
Dunklin. Gentry. Greene. New Madrid. Nodaway. Pettis. Polk. St. Francois. St. Louis.	Dunklin. Gentry. Greene. New Madrid. Nodaway. Pettis. Polk. St. Francois. St. Louis.	Boone. Dunklin. Greene. Jackson New Madrid. Nodaway. Pemiscot. Pettis. Polk. St. Francois. St. Louis.	Boone. Dunklin. Greene. Holt. Jackson. Marion. New Madrid. Nodaway. Pemiscot. Pettis. St. Francois. St. Louis.	Boone. Dunklin. Greene. Holt. Jackson. Marion. Mississippi. New Madrid. Nodaway. Pemiscot. Pettis. Scott. St. Francois. St. Louis.

[1] District.
[2] See reprint No. 1184, p. 34, from Public Health Reports of Oct. 21, 1927.

Table 1.—*List of counties or districts in which, as of January 1, 1924, 1925, 1926, 1927, and 1928, respectively, rural sections were provided with health service under whole-time local health officers*—Continued

1924	1925	1926	1927	1928
MONTANA				
Cascade	Cascade	Cascade	Cascade	Cascade
Lewis and Clark	Lewis and Clark	Lewis and Clark.	Lewis and Clark.	Lewis and Clark.
Missoula	Missoula	Missoula	Missoula	Missoula
NEW MEXICO				
Bernalillo	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Chaves	Chaves	Chaves	Chaves	Chaves
Colfax	Colfax	Colfax	Dona Ana	Dona Ana
Dona Ana	Dona Ana	Dona Ana	Eddy	Eddy
Eddy	Eddy	Eddy	McKinley	McKinley
McKinley	McKinley	McKinley	Santa Fe	Santa Fe
San Miguel	San Miguel	Santa Fe	San Miguel	Union
Santa Fe	Santa Fe	Union	Union	Valencia
Union	Union	Valencia	Valencia	
Valencia	Valencia			
NEW YORK				
Cattaraugus	Cattaraugus	Cattaraugus	Cattaraugus	Cattaraugus
NORTH CAROLINA				
Beaufort	Beaufort	Beaufort	Beaufort	Beaufort
Bertie	Bertie	Bertie	Bertie	Bertie
Bladen	Bladen	Bladen	Bladen	Bladen
Brunswick	Brunswick	Brunswick	Brunswick	Brunswick
Buncombe	Buncombe	Buncombe	Buncombe	Buncombe
Cabarrus	Cabarrus	Cabarrus	Cabarrus	Cabarrus
Columbus	Columbus	Columbus	Carteret	Carteret
Craven	Craven	Craven	Columbus	Columbus
Cumberland	Cumberland	Cumberland	Craven	Craven
Davidson	Davidson	Davidson	Cumberland	Cumberland
Durham	Durham	Durham	Davidson	Davidson
Edgecombe	Edgecombe	Edgecombe	Durham	Durham
Forsyth	Forsyth	Forsyth	Edgecombe	Edgecombe
Granville	Granville	Granville	Forsyth	Forsyth
Guilford	Guilford	Guilford	Granville	Granville
Halifax	Halifax	Halifax	Guilford	Guilford
Henderson	Henderson	Henderson	Halifax	Halifax
Hyde	Hyde	Johnston	Henderson	Henderson
Lenoir	Lenoir	Lenoir	Johnston	Johnston
Mecklenburg	Mecklenburg	Mecklenburg	Lenoir	Lenoir
New Hanover	New Hanover	New Hanover	Mecklenburg	Mecklenburg
Northampton	Northampton	Northampton	Nash	Nash
Pamlico	Pamlico	Pamlico	New Hanover	New Hanover
Pitt	Pitt	Pitt	Northampton	Northampton
Robeson	Richmond	Richmond	Pamlico	Pamlico
Rowan	Robeson	Robeson	Pitt	Pitt
Sampson	Rowan	Rowan	Richmond	Richmond
Surry	Rutherford	Rutherford	Robeson	Robeson
Vance	Sampson	Sampson	Rowan	Rowan
Wake	Surry	Surry	Rutherford	Rutherford
Wayne	Vance	Vance	Sampson	Sampson
Wilkes	Wake	Wake	Surry	Surry
Wilson	Wayne	Wayne	Vance	Vance
	Wilkes	Wilkes	Wake	Wake
	Wilson	Wilson	Wayne	Wayne
			Wilkes	Wilkes
			Wilson	Wilson

Table 1.—*List of counties or districts in which, as of January 1, 1924, 1925, 1926, 1927, and 1928, respectively, rural sections were provided with health service under whole-time local health officers*—Continued

1924	1925	1926	1927	1928
Allen. Ashtabula. Athens. Auglaize. Belmont. Butler. Clermont. Clinton. Columbiana. Coshocton. Crawford. Cuyahoga. Erie. Geauga. Hamilton. Hancock. Hocking. Huron. Lake. Lorain. Lucas. Mahoning. Marion. Meigs. Mercer. Miami. Montgomery. Morrow. Muskingum. Paulding. Perry. Richland. Ross. Sandusky. Scioto. Seneca. Shelby. Stark. Summit. Trumbull. Tuscarawas. Union. Washington. Wayne. Wood.	Allen. Ashtabula. Athens. Belmont. Butler. Clermont. Clinton. Columbiana. Coshocton. Crawford. Cuyahoga. Delaware. Erie. Fayette. Franklin. Geauga. Hamilton. Hancock. Hocking. Huron. Lake. Lorain. Lucas. Mahoning. Marion. Meigs Mercer. Miami. Mongomery. Morrow. Muskingum. Paulding. Perry. Richland. Ross. Sandusky. Scioto. Seneca. Shelby. Stark. Summit. Trumbull Tuscarawas. Union. Washington. Wayne. Wood.	Allen. Ashtabula. Athens. Belmont. Butler. Clermont. Clinton. Columbiana. Coshocton. Crawford. Cuyahoga. Delaware. Erie. Fayette. Franklin. Geauga. Hamilton. Hancock. Hocking. Huron. Jefferson. Lake. Lorain. Lucas. Mahoning. Marion. Meigs. Mercer Miami. Montgomery. Morrow Muskingum. Perry. Richland. Ross Sandusky. Scioto. Seneca. Shelby. Stark Summit Trumbull. Tuscarawas. Union. Washington. Wayne. Wood.	Allen. Ashtabula. Belmont. Butler. Clermont. Clinton. Columbiana. Coshocton. Crawford. Cuyahoga. Darke Delaware. Erie. Fayette Geauga. Hamilton. Hancock. Hocking. Huron. Jefferson. Lake. Lorain. Lucas. Mahoning. Marion. Meigs. Mercer Miami. Montgomery. Morrow. Muskingum. Perry Preble Richland. Ross. Sandusky. Scioto. Seneca. Shelby. Stark. Summit. Trumbull. Tuscarawas. Union. Washington. Wayne. Wood	Allen. Ashtabula. Belmont Butler. Clermont. Clinton. Columbiana. Coshocton. Crawford. Cuyahoga. Darke. Delaware. Erie. Fayette. Franklin. Geauga. Hamilton. Hancock. Hocking. Huron Jefferson. Lake Lorain Lucas Mahoning. Marion. Meigs Mercer. Miami Montgomery. Morrow. Muskingum. Perry Preble Richland. Ross. Sandusky. Scioto. Seneca. Shelby. Stark. Summit. Trumbull. Tuscarawas. Washington. Wayne. Wood.
OKLAHOMA				
Ottawa.	Carter. Le Flore. Muskogee. Oklahoma. Pittsburg.	Carter. Le Flore. McCurtain. Muskogee. Oklahoma. Okmulgee. Ottawa. Pittsburg.	Carter. Kay. Le Flore. McCurtain. Muskogee. Oklahoma. Okmulgee. Ottawa. Pittsburg.	Carter. Kay Le Flore McCurtain. Muskogee. Okmulgee. Ottawa. Pittsburg. Seminole.
OREGON				
Coos.	Clackamas. Coos. Douglas. Jackson. Klamath.	Clackamas. Coos. Douglas. Jackson. Klamath.	Clackamas. Coos Douglas. Jackson. Klamath.	Clackamas. Coos. Douglas. Jackson. Klamath. Marion. Multnomah.

TABLE 1.—*List of counties or districts in which, as of January 1, 1924, 1925, 1926, 1927, and 1928, respectively, rural sections were provided with health service under whole-time local health officers*—Continued

1924	1925	1926	1927	1928
		SOUTH CAROLINA		
Aiken Anderson. Charleston. Cherokee. Dillon Fairfield. Greenville. Newberry. Orangeburg.	Aiken. Anderson. Beaufort. Charleston. Cherokee. Colleton. Darlington. Dillon. Fairfield Georgetown. Greenville. Marion Newberry Orangeburg.	Aiken. Anderson. Beaufort. Charleston. Cherokee. Colleton. Darlington. Dillon. Fairfield. Georgetown. Greenville. Greenwood. Marion. Newberry. Orangeburg. Spartanburg.	Aiken Anderson. Beaufort. Charleston. Cherokee. Darlington. Dillon. Fairfield. Georgetown. Greenville. Greenwood. Horry. Marion Newberry Orangeburg Spartanburg.	Aiken. Anderson. Beaufort. Charleston. Cherokee. Darlington. Dillon. Fairfield. Georgetown. Greenville. Greenwood. Horry. Marion. Newberry. Orangeburg. Spartanburg.
		SOUTH DAKOTA		
Brown.	Brown. Pennington. Yankton.	Brown. Pennington. Yankton.	Brown Pennington.	Pennington.
		TENNESSEE		
Blount. Davidson Gibson. Montgomery. Obion Roane. Sevier. Williamson.	Blount. Davidson. Gibson. Montgomery. Obion. Roane. Rutherford. Sevier Williamson.	Blount Davidson Dyer. Gibson Hamilton Montgomery. Obion. Roane. Rutherford Sevier. Weakley. Williamson.	Blount Davidson Dyer Gibson. Hamilton. Lauderdale. Montgomery. Obion Roane Rutherford. Sevier Shelby. Weakley. Williamson.	Blount. Bradley. Davidson. Dyer. Gibson. Hamilton. Lake. Lauderdale. Montgomery. Obion. Roane. Rutherford. Sevier. Shelby. Washington. Weakley. Williamson.
		TEXAS		
Dallam. Hidalgo. Jefferson. Red River. Tarrant Washington.	Falls. Hidalgo. Nueces. Tarrant.	Cameron Hidalgo. Jefferson. McLennan Tarrant.	Cameron. Hidalgo. Jefferson. McLennan. Tarrant.	Cameron. Hidalgo. McLennan. Tarrant.
		UTAH		
Weber.	Davis. Weber.	Davis. Weber.	Box Elder. Davis. Morgan. Summit. Wasatch. Weber.	Box Elder. Davis. Summit. Utah. Wasatch.

Table 1.—*List of counties or districts in which, as of January 1, 1924, 1925, 1926, 1927, and 1928, respectively, rural sections were provided with health service under whole-time local health officers*—Continued

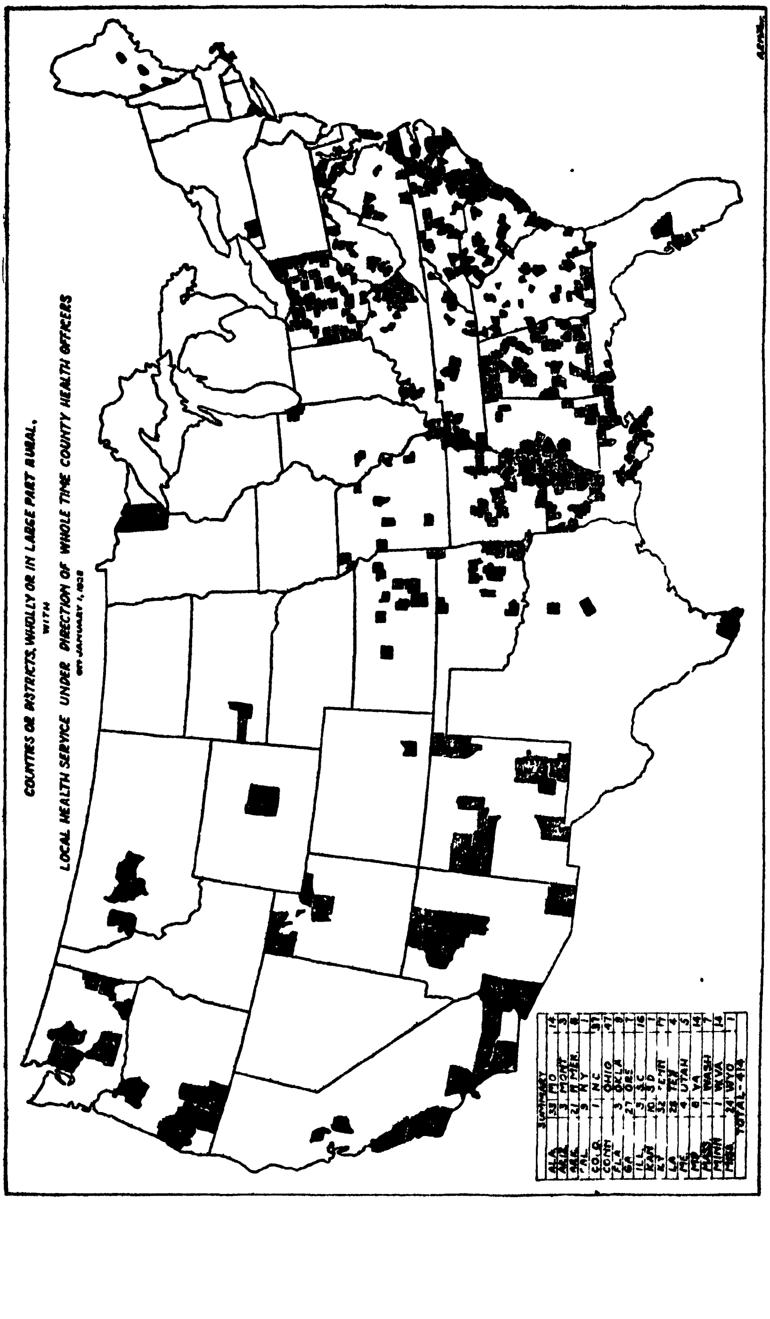
1924	1925	1926	1927	1928
		VIRGINIA		
Accomac. Albemarle. Arlington. Augusta. Fairfax. Halifax. Henrico. James City. Loudoun. Nansemond. Norfolk. Princess Anne. Russell. Wise.	Accomac. Albemarle. Arlington. Augusta. Brunswick. Fairfax. Halifax. Henrico. Isle of Wight. James City. Nansemond Northampton. Wise.	Accomac. Albemarle. Arlington. Augusta. Brunswick. Fairfax. Halifax. Henrico Isle of Wight. James City. Nansemond. Northampton. Sussex. Wise.	Accomac. Albemarle. Arlington. Augusta. Brunswick. Fairfax. Halifax. Henrico. Isle of Wight. James City. Nansemond. Northampton. Southampton. Sussex. Wise.	Accomac. Albemarle. Arlington. Augusta. Brunswick. Halifax. Henrico. Isle of Wight. Nansemond. Norfolk. Northampton. Princess Anne. Rockbridge. Southampton.
		WASHINGTON		
Chelan. King. Spokane. Walla Walla. Yakima.	Chelan. King. Spokane. Walla Walla. Yakima.	Chelan. King. Walla Walla. Yakima.	Chelan. King. Snohomish. Spokane. Walla Walla. Yakima.	Chelan. King. Snohomish. Spokane. Walla Walla. Whitman. Yakima.
		WEST VIRGINIA		
Hancock. Harrison. Logan. Marion. Preston. Taylor.	Gilmer. Hancock. Harrison. Logan. Marion. Marshall. Preston. Taylor.	Gilmer. Hancock. Harrison. Logan. Marion Marshall. Preston. Roane.	Boone. Brooke. Gilmer. Hancock. Harrison. Kanawha. Logan. Marion. Marshall. Ohio. Preston. Roane. Wood.	Berkeley. Boone. Brooke Gilmer. Hancock. Harrison. Kanawha. Lewis Logan. Marion. Marshall. Ohio. Preston. Wood.
		WYOMING		
Natrona.	Natrona.	Natrona.	Natrona.	Natrona.

Resumé of Table 1

State	Number of counties Jan 1— 1924	1925	1926	1927	1928	Increase or decrease in 1924	Increase or decrease 1925	Increase or decrease 1926	Increase or decrease 1927
Alabama	22	24	28	30	33	+2	+4	+2	+3
Arizona	0	1	1	2	3	+1		+1	+1
Arkansas	0	0	3	3	21		+3		+18
California	5	6	7	9	9	+1	+1	+2	
Colorado	0	0	1	1	1		+1		
Connecticut	0	1	1	1	1	+1			
Florida	0	0	1	3	3		+1	+2	
Georgia	19	21	22	24	27	+2	+1	+2	+3
Illinois	1	4	3	3	3	+3	−1		
Iowa	2	2	1	1	0		−1		−1
Kansas	8	6	10	9	10	−2	+4	−1	+1
Kentucky	9	8	8	9	32	−1		+1	+23
Louisiana	10	9	11	10	28	−1	+2	−1	+18
Maine	5	5	5	5	4				−1
Maryland	3	6	6	6	8	+3			+2
Massachusetts	1	1	1	1	1				
Minnesota	1	1	1	1	1				
Mississippi	10	11	13	18	24	+1	+2	+5	+6
Missouri	9	9	11	12	14		+2	+1	+2
Montana	3	3	3	3	3				
New Mexico	10	10	9	9	8		−1		−1
New York	1	1	1	1	1				
North Carolina	33	35	35	37	37	+2		+2	
Ohio	45	47	47	47	47	+2			
Oklahoma	1	5	8	9	9	+4	+3	+1	
Oregon	1	5	5	5	7	+4			+2
South Carolina	9	14	16	16	16	+5	+2		
South Dakota	1	3	3	2	1	+2		−1	−1
Tennessee	8	9	12	14	17	+1	+3	+2	+3
Texas	6	4	5	5	4	−2	+1		−1
Utah	1	2	2	6	5	+1		+4	−1
Virginia	14	13	14	15	14	−1	+1	+1	−1
Washington	5	5	4	6	7		−1	+2	+1
West Virginia	6	8	8	13	14	+2		+5	+1
Wyoming	1	1	1	1	1				
Total	250	280	307	337	414	+30	+27	+30	+77

The accompanying map shows the location of the counties or districts in the United States in the rural sections of which local health service under the direction of whole-time local (county or district) health officers was in operation on January 1, 1928

Within the period January 1, 1927, to January 1, 1928, whole-time county or (local) district health officer service was established in 84 units and was discontinued in 7—a net gain of 77 Of the units added to the list in 1927, 64 are counties which were more or less inundated by floods in the Mississippi valley or in the eastern part of Kentucky in the spring of that year and are located as follows 18 in Arkansas, 22 in Kentucky, 16 in Louisiana, 5 in Mississippi, 2 in Missouri, and 1 in Tennessee These projects were developed under a special arrangement—the respective State health departments directly concerned, the United States Public Health Service, and the Rockefeller Foundation, together, furnishing for a stipulated period about 75 per cent of the total funds for the operation of the county health departments Whether this quota of progress in the development of whole-time county health officer service, which was precipitated by the flood conditions, is to be permanent or temporary will be


COUNTIES OR DISTRICTS, WHOLLY OR IN LARGE PART RURAL,
WITH
LOCAL HEALTH SERVICE UNDER DIRECTION OF WHOLE TIME COUNTY HEALTH OFFICERS
ON JANUARY 1, 1928
SUMMARY
ALA 33 MO 14
ARIZ 3 MONT 3
ARK 21 N MEX 8
CAL 9 N Y 1
COLO 1 N C 37
CONN OHIO 47
FLA 3 OKLA 9
GA 27 ORE 1
ILL 3 S C 16
KAN 10 S D 1
KY 32 TENN 17
LA 28 TEX 4
ME 4 UTAH 5
MD 6 VA 14
MASS 1 WASH 7
MINN 1 W VA 14
MISS 24 WYO 1
TOTAL - 414

determined when and if the county governments are called upon to provide more than 25 per cent of the money for operation. In cooperative projects established under usual conditions [1] over 50 per cent of the funds for the support of the work are provided from official local sources.

Of the 414 counties or districts with local health service under whole-time local (county or district) health officers at the beginning of the present calendar year, 368, or 89 per cent, are receiving financial assistance for the support of their local health service from one or more of the following agencies: The State board of health, the United States Public Health Service, the Rockefeller Foundation, and the Children's Bureau of the United States Department of Labor.

Without assistance from outside agencies, local governments of rural communities (counties, towns, townships, or districts) in general are not disposed to appropriate adequately for the support of efficient, whole-time, local health service. Some local governments even when offered such assistance decline to appropriate their part of the budget for the service; but, according to all the evidence, development in this vitally important field of general welfare could be greatly increased by provision (which could be made at comparatively small governmental cost) to enable the State health departments and the Federal health service to offer to counties now willing to accept, and to those which would soon become willing to accept, adequate technical advice along with financial cooperation on a basis of $1 of Federal money and $3 of State money to meet four or more dollars of county money.

As health conditions in a rural community in one State influence those in other communities in that State and in other States, it seems that all the State governments and the Federal Government may be properly concerned with the development and maintenance of efficient local health service throughout our extensive rural area. The local health service, in doing its work efficiently, necessarily performs duties such as the collection of morbidity and mortality statistics and the carrying out of measures to prevent the spread of infection in intercounty and interstate traffic, for which the State governments and the Federal Government have a degree of definite responsibility.

There are in the United States about 2,500 counties or districts comparable to counties wholly or in considerable part rural to which local health service under the direction of whole-time county or local district health officers is applicable and in which such service would be highly advantageous. The number of these units of population in which such service was in operation at the beginning of the calendar years 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, and 1928, respectively, was 109, 161, 202, 230, 250, 280, 307, 337, and 414. The

[1] Reprint No 1184, p 31, from the Public Health Reports, Oct 21, 1927.

average annual net gain in this period has been 38. At such rate of progress, about 55 years yet would be required for reasonably adequate whole-time local rural health service to be extended to all communities of the United States in which such service is needed. To augment existing factors or to bring into operation additional factors, the speeding up of production seems critically important.

Experience indicates that the best foundation for rural health service in the United States is the county health department under the direction of the qualified whole-time county health officer. It becomes more and more evident to those with practical experience in the public health field that agencies concerned with the promotion of specialized health activities, such as typhoid-fever prevention, hookworm control, tuberculosis prevention, malaria control, venereal disease prevention, or child and maternity hygiene, can perform most effectively and economically by dovetailing their specific activities in with and making them a part of a well-balanced comprehensive program of local official health service under the immediate direction of qualified whole-time local health officers.

The present budgets for the support of the health service covering the rural communities and some of the incorporated cities and towns in the counties and districts designated in the 1928 column of Table 1 total $5,685,014.33. Of the total local population of 15,508,997 receiving this service 5,418,136, or 34.94 per cent, are urban. Therefore, about $3,698,670.32 of the total investment for the local health service in these 414 projects will be expended this year for strictly rural health service.

Reasonably adequate whole-time rural health service throughout this country would cost about $20,000,000 a year. Apart from the loss in human life, human health, and human happiness, our national economic loss annually in wage earnings and in other items incident to preventable sickness because of lack of efficient county health service is estimated at over $1,000,000,000. Money invested for well-directed whole-time county health service yields to the average local tax-paying citizen an annual dividend in dollars and cents ranging under different local conditions from 100 to 3,000 per cent.

Table 2 presents, by States, the percentage of rural population having local health service under the direction of whole-time local (county or district) health officers at the beginning of 1928.

TABLE 2.—*Percentage of rural population having on January 1, 1928, local health service under whole-time local (county or district) health officers*

State	Rural population (census, 1920)	Rural population with local health service under direction of whole-time health officers	Percentage of rural population with local health service under direction of whole-time health officers	State	Rural population (census, 1920)	Rural population with local health service under direction of whole-time health officers	Percentage of rural population with local health service under direction of whole-time health officers
Alabama	1, 838, 857	1, 057, 016	57. 48	Nevada	62, 153	0	0
Arizona	216, 635	44, 807	20. 68	New Hampshire	163, 322	0	0
Arkansas	1, 461, 707	485, 261	33. 19	New Jersey	680, 964	0	0
California	1, 095, 132	327, 377	29. 89	New Mexico	295, 390	89, 515	30. 30
Colorado	486, 370	13, 913	2. 87	New York	1, 795, 383	39, 708	2. 21
Connecticut	444, 292	11, 475	2. 58	North Carolina	2, 068, 753	1, 020, 067	49. 31
Delaware	102, 236	0	0	North Dakota	558, 633	0	0
Florida	612, 645	42, 240	6. 89	Ohio	2, 082, 258	1, 272, 144	61. 09
Georgia	2, 167, 973	507, 546	23. 41	Oklahoma	1, 488, 803	262, 563	17. 63
Idaho	312, 829	0	0	Oregon	392, 370	128, 014	32. 63
Illinois	2, 082, 127	123, 124	5. 91	Pennsylvania	3, 112, 202	0	0
Indiana	1, 447, 535	0	0	Rhode Island	15, 217	0	0
Iowa	1, 528, 526	0	0	South Carolina	1, 389, 737	593, 360	42. 70
Kansas	1, 151, 293	162, 168	14. 08	South Dakota	[illegible], 675	6, 943	1. 30
Kentucky	1, 783, 087	494, 364	27. 73	Tennessee	1, 726, 659	465, 709	26. 97
Louisiana	1, 170, 346	567, 353	48. 48	Texas	3, 150, 539	125, 584	3. 99
Maine	468, 445	26, 136	5. 58	Utah	233, 812	48, 621	20. 79
Maryland	580, 239	280, 251	48. 30	Vermont	242, 452	0	0
Massachusetts	202, 108	16, 562	8. 19	Virginia	1, 635, 203	347, 082	21. 23
Michigan	1, 426, 852	0	0	Washington	607, 886	231, 888	38. 15
Minnesota	1, 335, 532	50, 898	3. 81	West Virginia	1, 094, 694	338, 391	30. 91
Mississippi	1, 550, 497	535, 160	34. 52	Wisconsin	1, 387, 499	0	0
Missouri	1, 817, 152	339, 722	18. 70	Wyoming	137, 054	3, 188	2. 33
Montana	376, 878	32, 711	8. 68				
Nebraska	891, 066	0	0	Total	51, 406, 017	10, 090, 861	19. 63

Over 80 per cent of our rural population is as yet unprovided with official local health service approaching adequacy. As a consequence of this deficiency, there is a sacrifice of the health and lives and the material resources of many of our people every year—a sacrifice which is needless because preventable, and preventable by measures readily within our means and demonstrated to be in the highest sense economical.

EFFECT OF SALT ON SLUDGE DIGESTION[1]

By WILLEM RUDOLFS,[2] *Chief, Department of Sewage Disposal, New Jersey Agricultural Experiment Station, New Brunswick, N. J.*

The effect of increasing amounts of sodium chloride upon the rate of organic matter decomposition in sewage sludge by bacteria is, progressively, (*a*) indifferent, (*b*) stimulating, (*c*) retarding, and (*d*) toxic. These observations, based upon a large number of laboratory experiments, are in accord with the findings of Ricket (4), Falk and Winslow (3).

[1] Paper No. 58, Department of Sewage Disposal, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

[2] C. N. Henderson assisted with the necessary analyses.

There is a comparatively large number of sewage disposal plants where salt is received as mine water, brine, or soil leachings. When rather concentrated salt solutions are received continuously or temporarily a number of questions arise:

(1) How much salt can be handled by a tank without upsetting the biological equilibrium?

(2) What is its effect upon gas production?

(3) Is the composition of the gas changed?

(4) How much larger should the digestion capacity be?

METHODS AND MATERIAL

Fresh sewage solids were collected by hanging pails for 24 hours in the different sections of the flow compartments of an Imhoff tank receiving domestic waste only. The solids were thoroughly mixed and brought to the laboratory. The next day these fresh solids were mixed with ripe sludge on the basis of volatile matter content of the materials. The ratio used was 1 part of ripe sludge to 2.3 parts of fresh solids on the basis of volatile matter. The estimated time required for complete digestion of this mixture was 35 days. For the experiment, the mixed material was divided into equal portions to which varying amounts of sodium chloride were added. Table 1 shows the percentage of solids in the mixtures, the percentage of ash of these solids at the start and the end of the experiment, and the amounts of NaCl added. The mixtures were kept at laboratory temperature (averaging 70° F).

TABLE 1.—*Analyses of mixtures at beginning and end of experiment*

Sludge mixture number	NaCl added (grams per liter)	pH		Per cent solids		Per cent ash in solids	
		Begin	End	Begin	End	Begin	End
I	0	7.7	8.2	5.11	3.84	34.9	47.0
II	2	7.7	8.1	5.47	4.01	36.1	48.1
III	5	7.7	8.2	5.59	4.34	39.1	50.5
IV	10	7.7	7.9	6.03	5.40	43.7	48.9
V	20	7.8	7.4	7.17	6.35	48.2	54.9
Fresh solids		5.4		6.39		27.9	
Ripe sludge		8.2		3.88		48.5	

RESULTS

The results obtained are presented in condensed form in Table 2. The figures show that the percentage volatile matter reduction, percentage ash increase, and total gas production of mixture II receiving 2 grams of NaCl per liter of sludge, compared favorably with the mixture to which no salt was added. The effect of salt was only slightly noticeable with an addition of 5 grams, but with larger quantities, volatile matter destruction and total gas production

decreased markedly. It is interesting to note that, even with a 2 per cent salt concentration, the biological organisms retained 50 per cent of their activity as measured by the destruction of volatile matter and 25 per cent as measured by the production of gas. This, seems to be a long way from sterilization; but if the gas analyses figures are considered, it is evident that large quantities of salt affect especially those organisms responsible for methane production. The effect of the different salt concentrations is graphically shown in Figures 1 and 2, where the results are plotted on the basis of fresh

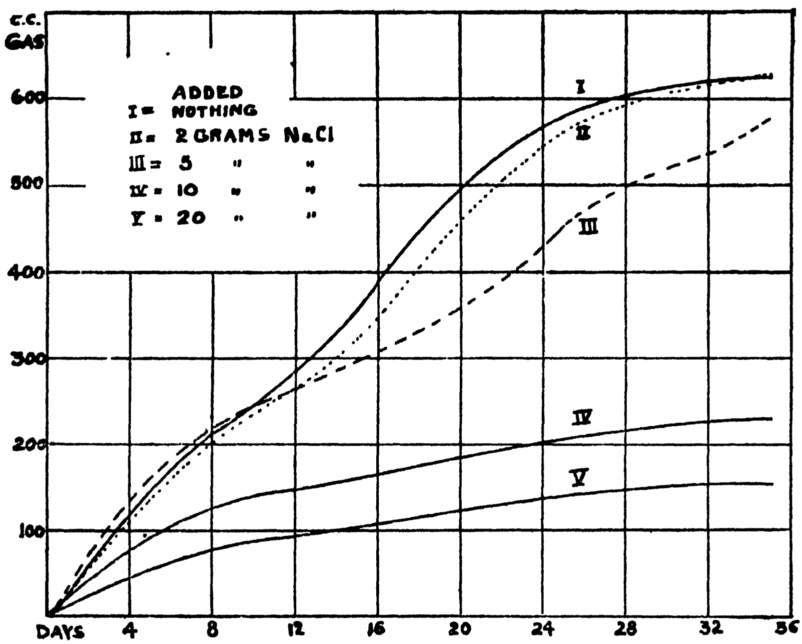


FIG. 1 Gas production per gram of volatile matter added as fresh solids from different mixtures

organic matter used. It can be seen that the percentage of volatile matter destruction in the mixture receiving 2 grams of salt was somewhat greater than it was in the untreated mixture, indicating a possible stimulation, causing greater reduction in volatile matter, but not a greater gas production. If stimulation takes place, it is in the direction of liquefaction. It is)eriod evident that a salt concentration up to 0.5 per cent has no materiai trimental effect upon the total activities of the organisms anc w ieco therefore not upset the biological balance in a digestion tank. Although the ultimate amount of gas produced from mixtures with 0.5 per cent salt concentration is nearly t cc same as from lower concentrations, the rate of gas production is ' mewhat retarded. (Fig. 1.)

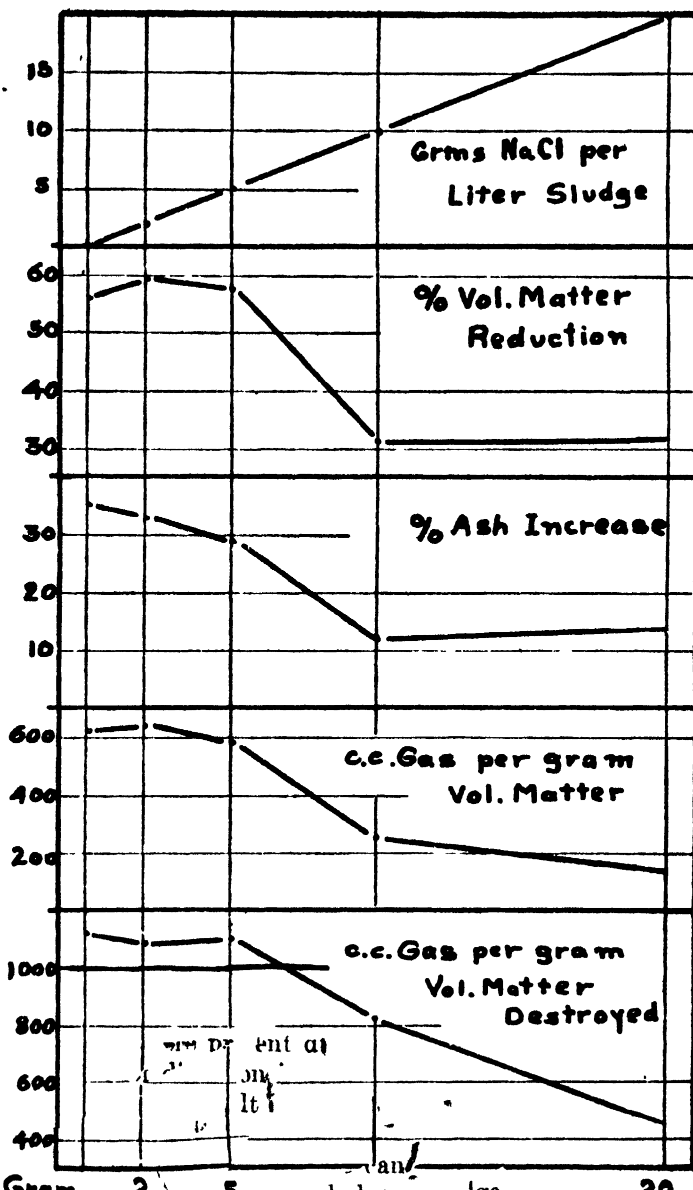


FIG. 2 —Perce. tage volatile matter ... ash increase, d total gas production from diffe. xtures

TABLE 2.—*Data on destruction of volatile matter and production of gas*

Sludge mixture No.	NaCl added (grams per liter)	Per cent reduction of volatile matter	Per cent increase ash in solids	Cubic centimeters of gas per gram of volatile matter			Analysis of gas [1]	
				In mixture	Destroyed	In fresh solids	Per cent CO_2	Per cent CH_4
I	0	38.9	34.7	434	1,112	621	11.0	70.9
II	2	41.3	33.2	447	1,080	638	10.0	75.3
III	5	36.8	29.2	401	1,100	580	13.7	80.7
IV	10	21.6	11.7	176	820	244	11.2	>1.0
V	20	22.0	13.7	108	492	156	19.8	>1.0

[1] Analyses of accumulated gas during third part of digestion period.

With higher concentrations (1 and 2 per cent concentrations), retardation of gas production is very pronounced. Blunk (2) has found that a great reduction in gas production took place in tanks receiving salt from mine drainage. Bach (1) states that the largest quantity of chlorides recorded amounted to 3,997 p.p.m., or, in the form of NaCl, 6,570 p.p.m. Sierp (6) conducting laboratory experiments, concludes that salt solutions up to 1 per cent concentration have no influence whatsoever upon digestion activities and that with concentrations of 3 per cent salt solution only about 20 per cent reduction in decomposition takes place. The total amounts of gas produced per gram dry material (fresh solids) after 80 days was practically alike for all mixtures, except with 3 per cent salt concentrations. The ripe sludge—fresh solids mixtures used by Sierp—were on an organic-matter basis of 1: 1 (ripe sludge 47.1 per cent and fresh solids 45.4 per cent volatile matter). Such a mixture would, at average laboratory temperatures of 70° F., be completed in less than 35 days, and it is possible that after 80 days of incubation (the time employed by Sierp) the retarding effect was not noticed.

The figures given in Table 2 for the composition of the gas produced need amplification. A small quantity of methane (7.9 per cent) was produced during the first period of the digestion time (35 days' digestion time) in No. IV (with 10 grams salt), but less than 1 per cent was found in No. V (20 grams salt). Carbon dioxide production was higher at the beginning in all except No. IV. The following figures show the difference in percentages CO_2 production for the gas collected during the second and last vident that estion:

imental effo

Difference in percentages of CO_2 production during ierefore not *eriods of digestion*

ough the ultimate

xtu *nd and* cent salt con-

n lower the

	II	III	IV	V
Second period	[illegible]	5.6	8.5	28.6
Last period	[illegible]	13.7	11.2	19.8

The usual reduction in percentage CO_2 and a corresponding increase in methane production took place with the advance of digestion in mixtures I, II, and III. The low methane production of mixture IV during the second part of digestion practically stopped, with a subsequent increase in CO_2 production. With smaller quantities of salt the percentage methane was high, possibly indicating that the methane producing organisms were somewhat stimulated, but with greater amounts of salt they were retarded.

Often when NaCl is received at a plant, smaller quantities of sulphates (Ca and Mg) are mixed with it, and it is of interest to compare such a mixture of approximately the same NaCl content with one receiving salt alone. The following figures show the total gas production in cubic centimeters per gram volatile matter present and per gram volatile matter destroyed in the processes of digestion:

Total gas production in cubic centimeters per gram volatile matter present and per gram volatile matter destroyed in digestion

Experiment	Salts added (grams per liter)	Cubic centimeters of gas produced	
		Per gram volatile matter present	Per gram volatile matter destroyed
A	None	438	1,125
B	5.1 NaCl	404	1,100
C	5.25 NaCl, 1.15 gr CaSO4, and MgSO4	400	1,645

The effect of NaCl on the total gas production is slight, but indicates retardation, whereas a mixture of NaCl and sulphates appeared to be somewhat stimulating. This stimulation came mainly after a somewhat prolonged retardation of gas production. This fact is well illustrated in Figure 3, in which the daily gas production is plotted in cubic centimeters per gram of volatile matter. However, an initial stimulation took place, probably due to the NaCl, because in the mixture with NaCl alone a similar initial stimulation in gas production was apparent. In another publication (5) we have drawn attention to the fact that sulphates produce considerable H_2S, and the mixture under discussion was not an exception. The strongest odors were present during the peak of gas formation.

As the rate of digestion is not materially affected with less than one-half of 1 per cent salt concentration, no additional sludge digestion capacity is required, provided a biological balance is established and maintained. Such a balance can be secured by maintaining a correct relation between ripe sludge and fresh solids, or, in other words, by the careful addition of fresh solids and withdrawal of sludge.

SUMMARY

The effect of salt upon the rate of decomposition of sewage sludge was only slightly noticeable with additions of 5 grams per liter of sludge, but with larger quantities the destruction of volatile matter and total gas production decreased markedly. The composition of the gas changed greatly with the salt additions. With the largest

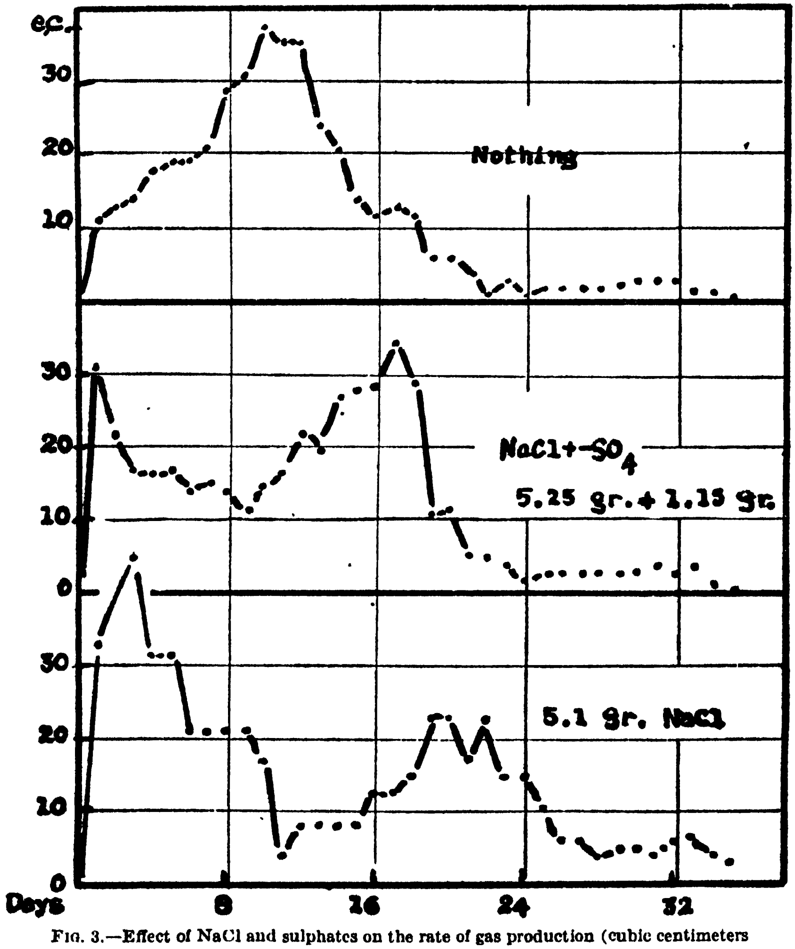


FIG. 3.—Effect of NaCl and sulphates on the rate of gas production (cubic centimeters of gas produced each day per gram of volatile matter)

quantities of salt practically no methane was produced. Mixtures of salt and sulphates appear to be somewhat stimulating.

REFERENCES

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(2) Blunk: Gesundh. Ing. 1926, p. 389.

(3) Falk and Winslow: Journ. Bact. 1926, v. 11, p. 1.

(4) Ricket: Compt. Rend. 1892, v. 114, p. 1492.
(5) Rudolfs, Willem, and Zeller, P. J. Alwin: Ind. and Eng. Chem. 1928 v. 20, p. 48.
(6) Sierp, Tech. Gemeindebl 1926-27 v. 29, nos. 21-24.

TEST FOR PHENOLIC TASTES AND ODORS IN WATER AFTER CHLORINATION

A meeting was held in Pittsburgh, Pa., February 6, 1928, at which were present representatives of the Pennsylvania State department of health, the Ohio State department of health, the Kentucky State board of health, the Carnegie Steel Co., the Youngstown Sheet & Tube Co., the Republic Iron & Steel Co., the Jones & Laughlin Steel Corporation, the Bethlehem Steel Co., the United Gas Improvement Co., and the Koppers Co. Mr. W. L. Stevenson, chief engineer of the Pennsylvania State department of health, chairman of the meeting, appointed a committee to consider the test for phenolic tastes and odors in water after chlorination, proposed by Mr. J. W. Ellms, of Cleveland, Ohio, and report their opinion. The committee as appointed consists of F. W. Sperr, jr., director of research, the Koppers Co.; W. H. Fulweiler, chemical engineer, the United Gas Improvement Co.; F. E. Daniels, chief, industrial waste section, Pennsylvania department of health; and O. O. Malleis, chief chemist, the Koppers Co.

The committee has considered the method as presented and is of the opinion that, while in principle the method may be satisfactory for water works practice, it should be substantially modified to render it generally applicable. It is believed that, in general, a method of this sort should embody the principle of systematic dilutions with a test of each dilution, so that quantitative results can be secured. On this basis the committee has therefore drawn up a tentative method which is herewith submitted, not as final and binding, but for the purpose of inviting trial and comment. It is hoped that this method will be thoroughly examined and tried by all who are interested in the subject, and the committee would appreciate having reports of the results obtained, together with any suggestions for modification or improvement that may be considered necessary.

The tentative method proposed by the committee is as follows:

1. This test is designed as a measure of the so-called phenolic tastes and odors in water after chlorination.

2. Take 500 c. c. of the material under examination, acidulate with sulphuric acid until acid to litmus, and distill off 250 c. c. Catch the distillate in a 500 c. c. volumetric flask, make up to mark with distilled water and dilute as follows: 1 to 10; 1 to 100; 1 to 1,000, etc., preparing as many dilutions as may be necessary.

3. Take 200 c. c. of the distillate in the volumetric flask after making up to mark (this representing the original material undiluted) and a like amount of each successive dilution. Treat with a slight excess of chlorine water (a total of 0.3 p. p. m. of chlorine is usually sufficient). Let the sample stand for 15 minutes and then boil until excess of chlorine is removed as evidenced by test with orthotolidine. Make the odor test by smelling the hot liquid. Make the taste test after the liquid is cooled. In the taste test, swallowing a small quantity of the liquid is the best method for revealing the presence of taste-producing substances.

4. Results shall be expressed as the lowest dilution in which the taste and the odor are negative.

F. W. Sperr, Jr.,
W. H. Fulweiler,
F. E. Daniels,
O. O. Malleis,
Members of the Committee.

Pittsburgh, Pa., *February 27, 1928*

Communications relative to the method should be addressed to F. W. Sperr, jr., Mellon Institute, Pittsburgh, Pa.

STUDIES ON OXIDATION REDUCTION

HYGIENIC LABORATORY BULLETIN NO. 151. STUDIES ON OXIDATION REDUCTION, PAPERS 1 10, INCLUSIVE, BY STAFF MEMBERS OF THE DIVISION OF CHEMISTRY, HYGIENIC LABORATORY, UNITED STATES PUBLIC HEALTH SERVICE

The Public Health Service has just issued a bulletin comprising 10 papers on oxidation reduction. These represent exhaustive studies upon certain fundamental principles of chemistry. They will be especially useful to chemists and to students of chemistry. The papers have already appeared separately in one form or another, but the demand for reprints has warranted the Service in collecting them under one cover.

The following list of subject headings of the different papers will give a conception of the scope of the studies collected in this bulletin:

I. Introduction. By W. Mansfield Clark.

II. An analysis of the theoretical relations between reduction potentials and pH. By W. Mansfield Clark and Barnett Cohen.

III. Electrode potentials of mixtures of 1-naphthol-2-sulphonic acid indophenol and the reduction product. By W. Mansfield Clark and Barnett Cohen.

IV. Electrode potentials of indigo sulphonates, each in equilibrium with its reduction product. By M. X. Sullivan, Barnett Cohen, and W. Mansfield Clark.

V. Electrode potentials of simple indophenols, each in equilibrium with its reduction product. By Barnett Cohen, H. D. Gibbs, and W. Mansfield Clark.

VI. A preliminary study of indophenols: (A) Dibromo substitution products of phenol indophenol; (B) substituted indophenols of the ortho type; (C) miscellaneous. By Barnett Cohen, H. D. Gibbs, and W. Mansfield Clark.

VII. A study of dichloro substitution products of phenol indophenol. By H. D. Gibbs, Barnett Cohen, and R. K. Cannan.

VIII. Methylene blue. By W. Mansfield Clark, Barnett Cohen, and H. D. Gibbs.

IX. A potentiometric and spectrophotometric study of meriquinones of the p-phenylene diamine and benzidine series. By W. Mansfield Clark, Barnett Cohen, and H. D. Gibbs.

X. Reduction potentials in cell suspensions. By R. K. Cannan, Barnett Cohen, and W. Mansfield Clark.

Copies of this bulletin may be obtained by addressing the Surgeon General, United States Public Health Service, Washington, D. C.

INTERNATIONAL SANITARY CONVENTION OF 1926 RATIFIED BY THE SENATE

On March 22, 1928, the Senate advised and consented to the ratification of the International Sanitary Convention signed at Paris on June 21, 1926.

This convention is a revision of the International Sanitary Convention of 1912, in which certain changes had become necessary because of the extension of knowledge in the field of sanitary science and a broader experience in the application of such knowledge in the field of international health. The preliminary arrangements for this revision were conducted through the International Office of Public Hygiene at Paris, which is constituted a central office for the collection and dissemination of sanitary intelligence and is empowered to cooperate with other international sanitary organizations. The convention was signed at Paris on June 21, 1926, by the plenipotentiaries of the following countries, colonies, and mandates:

Afghanistan.
Albania.
Argentine Republic.
Austria.
Belgium.
Brazil.
Bulgaria.
Chile.
China.
Colombia.
Cuba.
Czechoslovakia.
Denmark.
Dominican Republic.
Ecuador.
Egypt.
Ethiopia.
Finland.
France (including Algeria, French West Africa, French East Africa, French Indo-China, States of Syria, Grand Liban, Alaouites and Djebel-Druse, and other colonies, protectorates, possessions, and mandated territories).
Germany.
Great Britain (including Canada, Australia, New Zealand, and Union of South Africa).
Greece.
Guatemala.
Haiti.
Hedjaz.
Honduras.
Hungary.
Italy.
Japan.
Liberia.
Lithuania.
Luxemburg.
Mexico.
Monaco.
Morocco.
Netherlands.
Norway.
Paraguay.
Persia.
Peru.
Poland (and Free City of Danzig).
Portugal.
Rumania.
Salvador.
San Marino.
Serbs, Croats, and Slovenes, Kingdom of.
Soudan.
Spain.
Switzerland.
Tunisia.
Turkey.
Union of Soviet Socialist Republics.
United States of America.
Uruguay.
Venezuela.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Pneumonia held not compensable under workmen's compensation act.—(Minnesota Supreme Court; Costly *v.* City of Eveleth, 218 N. W. 126; decided February 17, 1928.) A member of a city fire department, as a result of exposure, chill, and some inhalation of smoke suffered while in the performance of his duties, contracted bronchial and lobar pneumonia from which he died. His widow was denied compensation under the workmen's compensation act by the State industrial commission, and appealed to the supreme court. Under the Minnesota compensation law mere sickness, with the exception of certain expressly enumerated occupational diseases, was not compensable unless the disease was "an accidental personal injury within the meaning" of the law. The law defined an accident as "an unexpected or unforeseen event, happening suddenly and violently, with or without human fault, and producing at the time injury to the physical structure of the body." The supreme court decided that

there had been no accident within the statutory definition, and affirmed the industrial commission's order, saying:

* * * In State ex rel. Faribault Woolen Mills Co. *v.* District Court, 138 Minn. 210, 164 N. W. 810, L. R. A. 1918F, 855, we held that typhoid fever contracted by an employee within the course of his employment and from a risk arising therefrom was not compensable. The reason was that there had been no accident within the statutory definition. The cases are reviewed and the reasons for the holding gone into at length in that decision. It is unnecessary to repeat or review them. In the present case there is no proof of "injury to the physical structure of the body" of the deceased, at the time, as a result of his work at the fire, as distinguished from the disease which soon followed. So, from the standpoint of the statutory definition of accident and its exclusionary effect upon mere sickness, we are unable to distinguish the pneumonia present in this case from the typhoid fever for which compensation was sought in the Faribault Woolen Mills Co. case.

The legislative definition of accident is admittedly difficult of application in such cases, but that difficulty does not permit us to ignore it or deny it effect. It is hard to see how it can have any function, or how we can give such obviously restrictive words their usual restrictive effect, unless we exclude from compensability such germ diseases as typhoid and pneumonia where there is no proof of a sudden and unforeseen event, as a cause, producing at the time injury to the physical structure of the body. * * *

Payment of pension to New York City Department of Health employee compelled.—(New York Supreme Court; Graef *v.* Department of Health et al., 227 N. Y. S. 82; decided January 30, 1928.) An employee of the health department of the city of New York became entitled to a pension, pursuant to city charter provisions. Beginning with January 1, 1927, the pension was denied him because the health commissioner suspected him of certain questionable activities during his employment in the department. The position the commissioner of health assumed was that, because of public policy, he had suspended the pension rights of the petitioner pending investigation. The city charter provided:

Any * * * employee who has or shall have performed duty as such * * * employee in any department of health in the city of New York, for a period of 20 years, or upward, upon his own application, in writing, * * * shall be retired from active service * * * and thereupon shall be awarded, granted, and paid from said health department pension fund by the trustees thereof, an annual sum during his lifetime not exceeding one-half the ordinary full pay of * * * [an] employee in the health department service, of the rank of the * * * employee so retired. Pensions granted under this section shall be for the natural life of the person receiving the same, and shall not be revoked, repealed, or diminished.

The employee sought to compel payment to him of the moneys withheld from him as a pension, and the court, in deciding in his favor, said that "it must be concluded that in the premises respondents are without power to order the suspension or discontinuance of the petitioner's pension, and, irrespective of how well intentioned the commissioner of health may be, the peremptory order of mandamus must be granted."

PUBLIC HEALTH ENGINEERING ABSTRACTS

The Mosquito Nuisance and Malaria (Über Muckenplage und Malaria). E. Martini. *Medizinische Klinik*, No. 12, 1927. Berlin. Germany. (Abstract by A. L. Dopmeyer.)

The author of this article published an article on the same subject in January, 1924, in which he discussed the status of malaria in Germany and the prospects for the future. His optimistic predictions as to results to be expected in the control of the mosquito nuisance and malaria were confirmed by results obtained in 1924 and 1925, but not so in 1926. This article is written to explain the reason for the large increase in numbers of mosquitoes in 1926.

The heavy rains in June and July of the previous year, which reached flood proportions in places and were responsible for the creation of a large number of pools of standing water, are characterized as being responsible for mosquitoes in larger numbers in 1926 than has been the case for a long time.

Two means of combating the mosquito are offered: (1) Winter control, by killing the mosquitoes found in houses, and (2) summer control, by killing the larvae in the breeding places. The latter method is considered the more difficult and requires personnel trained in the work, and so the winter control is suggested, although its success must be considered limited. The mosquitoes which hibernate in basements consist almost entirely of the three species: (1) *Culex pipiens;* (2) *Theobaldia annulata;* and (3) *Anopheles maculipennis.*

Winter control, however, does not take care of the *Aedes*, which lays its eggs in trenches or depressions in the earth and hatches in the spring after the first rains.

It is to be expected that after an autumn epidemic there will be a somewhat more severe epidemic in the spring of the following year, which latter begins in March, rises to a peak in May, and falls off abruptly in June. It consists of relapsing and new cases, the former being subject to immediate control, since they will be expected, but the latter probably not. These latter cases must be watched and treated so as to prevent the spread of infection.

If conditions in 1927 should again be favorable to the production of a large crop of pest mosquitoes, and meteorological conditions should be favorable to malaria production, a further increase in mosquitoes and malaria cases might result. In that event it would be wise to spare no efforts toward effective winter and summer control of mosquitoes, particularly the *Anopheles.*

Notes on the Pasteurization of Milk. J. M. Hamill. Ministry of Health. Reports on Public Health and Medical Subjects, No. 17. 14 pp. London, 1923. H. M. S. O. (Reprinted 1927). Abstract by W. G. Savage in *Bulletin of Hygiene*, vol. 3, No. 1, January, 1928, p. 17.

"A clear and concise report upon the essential factors concerned in successful Pasteurization, but one which does not go into many of the contentious scientific problems. For example, the temperature adopted for Pasteurization is taken at 145° F. to 150° F. for 30 minutes, this being regarded as a safe temperature without damage to the milk without discussing in detail the scientific evidence. (A slightly lower temperature is usually advocated in the United States.) Great stress is laid upon the absolute necessity of Pasteurizers of the 'holder' type. But little is said in regard to the mechanical difficulties in the way of the construction of a perfectly satisfactory 'holder' Pasteurizer.

" The report is intended as a brief general account of the subject and as a guide to local authorities as to requirements essential for the provision of the milk designated 'Pasteurized milk.' "

The Intermittent Irrigation Fields of Lubertzi (Moscow) During the First 10 Years of Operation (1914–1924). (In French). I. S. Bessonoff, P. S. Savos-

tianoff, and N. M. Welitchkine. 5th Report Res. Comm. No. 9, 1928. 152 pages. (Abstract by W. Rudolfs.)

The sewage of Moscow (separate system) is used for irrigating municipal lands at Lublino, which is 10 km. from Moscow, has a surface area of 948 hectares, and on which sewage is used at a rate of 56570 m³ per day; and at Lubertzi, which is 22 km. from Moscow, has an area of 640 hectares and receives sewage at the rate of 37530 m³ per day. Lutbertzi fields have been in service since 1914, and the report deals with the history of the fields during "maturation" (2-3 years), the abnormal years 1917–22, and the normal years of 1923–27. Distribution canals are constructed partly from masonry and partly from earth. The fields are divided into sections ranging from 0.25 to 2.5 hectares. The exploitation of the three farms requires 50 administrative and technical employees and 440 farmers and laborers. A stable with 150 horses and 22 cows is at the disposition of the workers. There is further a hospital, 2 schools, etc., for the nearly 2,000 persons.

The harvests are from two to two and one-half times larger than those of the surrounding prairies. Cabbage gives the best returns (33,600 kilos per hectare). Beets and hemp are also very good. The excess of green fodder is very useful for the dairy.

The effect of the treatment upon the irrigated lands is determined by chemical analyses of the sewage and drainage water collected in subterranean basins (Lysimeters). Chlorides are taken as basic figures for comparison. Suspended matter in sewage (1914) was 536 p. p. m.; fixed, 963; Cl, 147; total N, 90; NH_3, 83. During 8 years 22,000 tons of suspended matter have been placed on 450 hectares. Of the 3,099 tons of nitrogen received by the fields, 1,654 tons drained into the Pekhorka River. There were no harmful effects on the river, and it is given as an excellent example of self-purification. During 1920–21 the average results of tests of the river in p. p. m. were as follows:

	Upstream	Downstream		Upstream	Downstream
Suspended matter	5.9	4.0	NH_3	0.4	1.0
Cl	6.6	21.6	NO_3	.3	3.8
			O_2 demand	16.9	13.0

These figures give only average yearly conditions and can be used only as a summary. The authors expect to use American methods for interpretation. Three kilometers below the outfalls, the river is extensively used for recreational purposes.

Bacteriological results will be published in the following number of the reports.

Essential Features of an Efficient Municipal Sewerage System. C. A. Holmquist. *The American City*, vol. 37, No. 5, November, 1927, pp. 609–612. (Abstract by L. F. Warrick.)

The author points out, in a general discussion of municipal sewerage systems, that the essential features include (1) properly installed house plumbing, which may be regulated by plumbing code in village as well as city; (2) tight sanitary sewers laid in accordance with a comprehensive plant; (3) adequate sewage-treatment plant in charge of operators selected on the basis of knowledge and ability; (4) the tendency toward larger sewer systems, which are now made possible in New York State by the sanitary district laws; (5) the greater latitude given village trustees in sewer matters under the amended village law in the State of New York; and (6) the possibilities of sewer rentals based on water consumption as a source of revenue for building and operating sewage-treatment plants.

Some of the Newer Results Obtained at the New Jersey Experiment Station.—Willem Rudolfs. Proceedings Tenth Texas Water Works Short School, January, 1928. (Abstract by Jane H. Rider.)

Experimental work in New Jersey indicates that new methods of sewage disposal can be found only by studying the biophysicochemical conditions governing the settling, decomposition, and drying of sewage solids.

It has been found that combination of the activated sludge process and separate sludge digestion gave better results than a combination of single sedimentation and separate sludge digestion. When properly seeded, activated sludge digests more rapidly and with less odor than properly seeded solids from Imhoff or sedimentation tanks and gives a better effluent.

The addition of sea water or other liquids with high sulphate content retards the digestion of sewage solids in proportion to the amount of sulphates present. H_2S is markedly increased by even small amounts of sea water or wastes containing sulphates.

Experimental work is being done on the digestion of vegetable wastes and fine screenings Garbage from one kitchen and fine screenings were finely ground before being mixed with ripe sludge and fresh solids. Maximum gas production took place in 20 days in mixtures of ripe sludge, fresh solids, and screenings, and was similar for the limed and unlimed portions, producing more gas in 40 days than the ripe sludge-fresh solids mixture. Sufficient stability had not been reached in the 20-day period to permit the sludge to be drawn.

In mixtures of ripe sludge, fresh solids, and vegetable waste, 1:1:1 ratio, maximum gas production was completed in 40 days, the addition of lime accelerating gas production. When the fresh solids were replaced with vegetable waste, little gas was produced; lime somewhat increased its production.

The excessive lime necessary to correct the acidity in vegetable waste mixtures indicates that high gas-yielding carbonaceous substances can not be added indiscriminately to domestic sewage. If the reaction is not kept slightly alkaline, the acidity will change the type of digestion, retard the activities of certain organisms, and cause the evolution of H_2S and other volatile, odoriferous substances. Greater digestion tank capacity will be necessary if vegetable wastes are added to domestic sewage on account of the increased weight of solids and the slower rate of digestion. The separate digestion of mixed vegetable wastes is not economical

Tables and charts showing results obtained in these studies are given.

Imhoff Tanks -Their Function and Operation. A. L. Fales. Proceedings of the First Conference of Sewage Works Operators, Pennsylvania State College Bulletin, No. 1, January, 1927, pp. 10–20. (Abstract by L. F. Warrick.)

Imhoff tanks are discussed in a comprehensive manner as to function, importance of proper operation, method of putting into service, operation under both favorable and unfavorable conditions, value of records and research work, and care of plant and grounds. The function of the Imhoff tank is sedimentation of settleable suspended solids and bacterial digestion of resulting sludge in the same tank, without contaminating the settled sewage with products of sludge decomposition. Comparisons are made with plain sedimentation, septic, and separate sludge digestion tanks, in each case pointing out the advantages of Imhoff tanks operating under favorable conditions. Tried methods of overcoming various operating difficulties are briefly described and discussed.

Water Supply in Bradford (England). Lewis Mitchell. *Surveyor*, vol. 73, No. 1, 876, January 6, 1928, pp. 3 4. (Abstract by J. K. Hoskins.)

This report illustrates several divergent points of view on English and American water works practice. The city population of 288,700 consumes 58.1 gallons per capita, 35.3 gallons per capita of which are for domestic and 22.8 gallons for

industrial purposes; the corresponding consumption of outlying districts, with a population of 100,000, is 31.4 and 18.9 gallons per capita, respectively. Yet the statement is made that "although it is only one-third of the quantity consumed in 'dry' American cities, it is greatly in excess of what is reasonably required." (The word "dry" is not defined.) Metering of domestic services is not advocated, for sanitary reasons.

B. coli are present at times and are chiefly accounted for as coming from cultivated areas on the drainage area. Chlorination is not considered "expedient or desirable," and "may be considered purely as a last line of defense." Filtration is provided as a further safeguard for supplies from practically uncontaminated sources. The difficulty of finding pure sources requiring no chemical treatment is in many cases becoming acute, but Bradford has provided against this contingency.

The water is at times plumbo solvent, containing as high as 0.113 grains per gallon of lead. The acidity is neutralized by a "harmless reagent" to correct this solvent action.

Data on Applying Chlorine to Safeguard Water Systems. R. V. Donnelly. *Water Works Engineering*, vol. 81, No. 3, February 1, 1928, pp. 162–166. (Abstract by Chester Cohen.)

This article cites numerous practical points concerning the operation and care of chlorine-control apparatus. The functions of the various units of chlorinators are discussed and explained. All of the data could not well be repeated here. The following are examples of the type of information given: A solution-feed apparatus requires a water supply under at least 20 pounds per square inch pressure, and there must be 50 gallons of this water for every pound of chlorine used; the temperature of the apparatus should be kept at 45° F. or above; 50 pounds of chlorine per day can be safely drawn per cylinder; if none is drawn the cylinder tends to freeze; the usual chlorinator orifice has a ratio of 5 maximum to 1 minimum, thus an orifice of 50 pounds maximum will have a minimum of 10 pounds.

Proper care of the apparatus, protection against corrosion, flooding, stoppage, etc., are emphasized. The uses of chlorine as an algicide, as well as a bactericide, is brought out, together with present practices regarding superchlorination and dechlorination.

Colon Bacilli in Water Which May Cause Typhoid Diseases. Robb S. Spray. *Water Works Engineering*, vol. 81, No. 1, January 4, 1928, pp. 38 and 57. (Abstract by R. C. Beckett.)

The three general indices proposed for the determination of the index of pollution of water supplies, namely, fecal streptococci, proteolytic and fermentative anaerobes, and the colon bacillus group, have, due to difficulty of routine tests, been reduced to the latter group. This group, however, classifies some 34 bacteria, the most confusing being *B. aerogenes*. First indication of *B. aerogenes* is the greater amount of gas in lactose broth (60–80–90 per cent within 24 hours, as contrasted with 30–40 per cent with the true *B. coli*).

It has been impossible to devise any test which will differentiate the colon bacilli of human origin from those of lower animal origin—probably because they are the same.

Preliminary Experiments on the Treatment of Lake Michigan Water for Chicago. John R. Baylis. *Journal American Water Works Association*, vol. 17, No. 6, June, 1927, pp. 710–726. (Abstract by F. R. Shaw.)

This article gives a complete list of the studies planned at Chicago and discusses preliminary considerations in regard to clarification.

An investigation showed that it would not be economical to extend the intakes to such a distance (10 miles—40 ft. depth) from shore as would provide

a water of satisfactory clarity. The water at the present intakes has a turbidity of 3 to 100 p. p. m., averaging 10; a hardness of 130 p. p. m., mostly carbonate; appears to be saturated with soluble silica and alumina; and at times has an extremely high content of microorganisms, which presents the most difficult problem.

The author cites the desirability of designers paying more attention to "length of filter runs," and sets as a standard a yearly average of 24 hours. He says the minimum for efficient operation is 16 hours, and to secure runs in excess of 24 hours does not warrant much added expense. Reference is made to his studies at Baltimore which resulted in his suggesting a standard of clarity of 0.1 to 0.2 p. p. m. (0.5 is noticeable in bathtubs). A curve is given showing a decided break at 0.1 to 0.2 p. p. m., when the amount of coagulant was plotted against the turbidity of the filter effluent.

The laboratory at Chicago is equipped with a specially designed experimental filter which is particularly flexible, and with a stirring device which is adjustable as to depth of paddles in the sample and speed of rotation.

The experiments so far conducted indicate that the lake water is easily clarified and reacts economically to practically all the extensively used coagulants.

Experiments produced a resultant turbidity of 0.2 p. p. m., after treating with two-tenths of a grain per gallon of alum, stirring 30 minutes, and passing through the laboratory filter containing sand passing 20 mesh and retained on 30. The author believes that this should not be exceeded by more than 25 per cent in a well-designed plant. During periods when microorganisms are in abundance, more coagulant may be necessary. Treatment with iron and lime is considered. Two grains of lime (CaO) per gallon is the maximum that can be used without recarbonization, and this treatment reduces hardness 35 p. p. m.

The curve presented shows that a clarity of 0.2 p. p. m. results from a treatment of 2 g. p. g. of lime and 0.2 g. p. g. of iron with a raw water turbidity of 12 p. p. m. and 30-minute stirring.

Use of excess of lime with recarbonization is being considered, but it is initially thought to be uneconomical for a water of only 130 p. p. m. hardness. However, this treatment would solve the filter clogging troubles from microorganisms, and its sterilizing qualities might prove of value. If used, a treatment of 6 grains of lime would be desirable, with carbonization of the caustic alkalinity before passing the water through settling basins, thus reducing the total hardness to approximately 50 p. p. m.

Progress Report on Raw Water Carbon Dioxide Treatment at Lima. E. E. Smith. Sixth Annual Report of Ohio Conference on Water Purification, 1926, pp. 83-84. (Abstract by R. E. Thompson.)

Brief additional data are given on carbonization at Lima, Ohio. An improved type of coke burner has been installed. Experiments indicated that the use of artificial gas for generation of carbon dioxide would increase cost tenfold. Average amounts of chemicals used during period September, 1925–August, 1926, were as follows: Alum 2.27 g. p. g.; coke 5.9 p. p. m.; chlorine 0.25 p. p. m.—the average chemical cost per m. g. being $4.56.

DEATHS DURING WEEK ENDED MARCH 31, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended March 31, 1928, and corresponding week of 1927. (From the Weekly Health Index, April 4, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Mar. 31, 1928	Corresponding week, 1927
Policies in force	70, 802, 855	67, 195, 853
Number of death claims	15, 118	14, 265
Death claims per 1,000 policies in force, annual rate	11. 2	11. 1

Deaths from all causes in certain large cities of the United States during the week ended March 31, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, April 4, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Mar. 31, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 31, 1928 [2]
	Total deaths	Death rate [1]		Week ended Mar. 31, 1928	Corresponding week 1927	
Total (67 cities)	8, 746	15. 3	13. 6	986	808	80
Akron	43			7	6	76
Albany [3]	45	19. 5	15. 3	3	3	61
Atlanta	92	18. 9	14. 7	13	8	
White	43		8. 9	5	2	
Colored	49	(4)	28. 2	8	6	
Baltimore [3]	291	18. 3	14. 6	37	26	117
White	220		12. 9	19	19	76
Colored	71	(4)	24. 2	18	7	282
Birmingham	67	15. 8	14. 4	5	8	43
White	36		8. 6	2	5	28
Colored	31	(4)	23. 4	3	3	68
Boston	268	17. 5	15. 5	39	31	108
Bridgeport	40			6	0	110
Buffalo	149	14. 0	13. 3	24	12	103
Cambridge	35	14. 5	11. 4	6	2	107
Camden	44	17. 0	13. 3	7	5	112
Canton	21	9. 4	9. 7	3	3	71
Chicago [3]	915	15. 2	13. 1	85	82	78
Cincinnati	166	21. 0	17. 8	49	16	115
Cleveland	220	11. 4	11. 2	23	25	62
Columbus	106	18. 6	12. 0	11	6	103
Dallas	66	15. 9	11. 6	12	8	
White	45		10. 5	9	7	
Colored	21	(4)	19. 0	3	1	
Dayton	49	13. 9	16. 2	0	5	0
Denver	92	16. 4	13. 5	6	7	
Des Moines	43	14. 8	11. 2	2	4	33
Detroit	384	14. 6	11. 9	61	44	94
Duluth	24	10. 7	6. 8	1	0	23
El Paso	60	26. 6	16. 1	12	6	
Erie	29			2	3	41
Fall River [3]	22	8. 6	9. 0	3	2	51
Flint	24	8. 4	15. 0	9	7	115
Fort Worth	44	13. 7	11. 5	7	1	
White	31		10. 5	5	1	
Colored	13	(4)	18. 6	2	0	
Grand Rapids	34	10. 8	10. 6	3	4	45
Houston	70			7	3	
White	51			3	3	
Colored	19	(4)		4	0	
Indianapolis	102	14. 0	12. 4	23	9	175
White	88		10. 9	19	7	166
Colored	14	(4)	23. 3	4	2	243

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday Mar. 30, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended March 31, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, April 4, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Mar. 31, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Mar. 31, 1928
	Total deaths	Death rate		Week ended Mar. 31, 1928	Corresponding week 1927	
Jersey City	79	12.7	12.2	15	4	112
Kansas City, Kans	52	23.0	11.1	5	1	106
White	42		9.7	3	1	74
Colored	10	[4]	17.2	2	0	290
Kansas City, Mo	147	19.7	16.5	15	6	106
Knoxville	20	9.9	18.4	0	1	0
White	18		16.8	0	1	0
Colored	2	[4]	29.9	0	0	0
Los Angeles	250			18	19	51
Lowell	29	13.7	13.7	6	0	125
Lynn	35	17.3	11.9	4	7	101
Memphis	79	21.7	22.2	8	2	94
White	44		16.7	6	0	112
Colored	35	[4]	32.1	2	2	63
Milwaukee	125	12.0	12.4	19	19	85
Minneapolis	88	10.1	12.0	10	8	60
Nashville	53	20.0	18.2	7	2	110
White	41		17.4	6	2	128
Colored	12	[4]	20.1	1	0	60
New Bedford	35	15.3	14.0	3	3	65
New Haven	50	13.9	1[illegible].2	4	7	56
New Orleans	179	21.8	18.8	12	15	58
White	101		13.8	3	6	22
Colored	78	[4]	33.1	9	9	131
New York	1,770	15.4	13.4	192	164	78
Bronx Borough	196	10.8	10.8	10	19	30
Brooklyn Borough	611	13.8	12.1	73	62	73
Manhattan Borough	749	22.4	18.1	83	62	98
Queens Borough	158	9.7	8.8	22	19	89
Richmond Borough	56	19.4	17.8	4	2	72
Newark, N. J	128	14.1	15.0	16	11	82
Oakland	60	11.4	13.1	3	4	33
Oklahoma City	38			0	4	
Omaha	76	17.8	12.8	6	5	70
Paterson	49	17.7	8.0	7	1	121
Philadelphia	640	16.2	14.4	62	65	84
Pittsburgh	222	17.3	15.7	33	34	108
Portland, Oreg	47			3	3	32
Providence	78	14.2	13.8	6	7	52
Richmond	57	15.3	13.9	4	3	52
White	33		11.9	1	3	20
Colored	24	[4]	18.8	3	0	110
Rochester	73	11.6	14.0	10	7	81
St. Louis	254	15.7	14.0	14	20	47
St. Paul	51	10.6	15.4	5	5	48
Salt Lake City [3]	45	17.0	10.4	7	4	114
San Antonio	86	20.6	13.6	11	12	
San Diego	51	22.3	19.0	10	3	190
San Francisco	160	15.1	13.9	10	9	63
Schenectady	24	13.4	12.9	2	2	63
Somerville	17	8.7	12.3	3	4	104
Spokane	40	19.2	11.5	4	4	103
Springfield, Mass	35	12.2	13.4	2	6	32
Syracuse	45	11.8	11.9	5	6	61
Toledo	58	9.7	14.5	7	7	67
Trenton	43	16.2	14.5	6	4	102
Utica	35	17.6	18.7	6	3	135
Washington, D. C	137	13.0	14.6	13	7	74
White	84		12.1	5	4	41
Colored	53	[4]	21.8	8	8	148
Waterbury	16			2	1	58
Wilmington, Del	30	12.2	13.6	1	2	26
Worcester	77	20.4	12.0	10	4	121
Yonkers	27	11.6	10.5	0	4	0
Youngstown	35	10.5	8.0	9	2	120

[3] Deaths for week ended Friday, Mar. 30, 1928.

[4] In the cities for which deaths are showed by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended April 9, 1927, and April 7, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 9, 1927, and April 7, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928
New England States:								
Maine	5		3	8	206	25	1	0
New Hampshire		1				7		0
Vermont					109	56	0	0
Massachusetts	100	76	18	14	251	1,948	5	1
Rhode Island	8	7			3	242	0	0
Connecticut	35	25	7	9	95	371	2	3
Middle Atlantic States:								
New York	470	332	[1] 54	[1] 77	964	2,829	3	36
New Jersey	120	92	28	23	57	1,354	0	5
Pennsylvania	176	135			599	1,518	1	7
East North Central States:								
Ohio		78		34		814		2
Indiana	21	22	82	21	261	272	0	0
Illinois	125	167	68	228	1,990	226	10	13
Michigan	104	60		8	225	1,744	0	5
Wisconsin	34	27	44	360	691	127	5	7
West North Central States:								
Minnesota	43	23	1	2	248	53	2	2
Iowa	21	14			698	25	0	0
Missouri	43	37	1	57	276	392	0	7
North Dakota	2	5		19	145	2	0	4
South Dakota [4]	5		2	15	274	56	0	0
Nebraska	3	6		303	203	28	0	3
Kansas	15	12	5	15	1,008	117	1	1
South Atlantic States:								
Delaware	3	3	2		14	14	0	0
Maryland [2]	45	30	117	27	37	753	1	0
District of Columbia	19	15	2	[4] 2	5	234	0	1
Virginia								
West Virginia	21	34	61	26	170	131	0	2
North Carolina	16	43			885	2,736	0	0
South Carolina	11	36	1,649	784	91	1,177	0	0
Georgia	12	7	304	121	126	143	1	2
Florida	10	5	1	8	182	42	0	0

[1] New York City only.
[2] Week ended Friday.
[4] The report for New Mexico, p. 831, Public Health Reports, Apr. 6, 1928, was for the week ended Mar. 17, instead of Mar. 24, and that for South Dakota was for the week ended Mar. 24.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 9, 1927, and April 7, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928
East South Central States:								
Kentucky		10		33		345		0
Tennessee	6	11	114	185	186	309	1	1
Alabama	20	10	215	332	278	443	1	1
Mississippi	8	9						
West South Central States:								
Arkansas	6	6	86	222	180	244	0	0
Louisiana	65	31	16	27	214	222	0	[5] 1
Oklahoma [3]	21	20	135	579	322	314	1	5
Texas	37	53	40	611	245	561	0	1
Mountain States:								
Montana	1	1			35	2	8	7
Idaho	1				55		2	1
Wyoming	2			6	82	21	1	2
Colorado	11	15		1	320	183	9	16
New Mexico [4]	3	5		4	117	166	0	0
Arizona		5	1	129	47	33	0	2
Utah [2]	11	1	2		58	6	1	4
Pacific States:								
Washington	19	10	6	1	309	151	6	9
Oregon	14	6	54	36	242	77	1	3
California	107	91	61	25	3,168	125	8	4

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928
New England States:								
Maine	0	0	35	15	0	0	4	4
New Hampshire		0		3		0		0
Vermont	0	0	11	2	0	0	0	0
Massachusetts	1	4	464	316	0	0	8	1
Rhode Island	0	0	17	33	0	0	1	0
Connecticut	0	0	101	95	0	0	0	1
Middle Atlantic States:								
New York	4	1	1,230	873	6	0	15	14
New Jersey	1	8	362	200	0	25	9	5
Pennsylvania	1	1	606	367	0	1	5	13
East North Central States:								
Ohio		2		347		58		16
Indiana	0	0	179	124	119	138	1	3
Illinois	0	1	281	329	33	37	14	12
Michigan	0	0	243	239	20	24	5	9
Wisconsin	0	0	191	185	1	17	1	3
West North Central States:								
Minnesota	0	2	217	120	1	1	1	6
Iowa	0	0	71	80	17	56	9	0
Missouri	0	1	119	96	10	76	4	1
North Dakota	2	0	72	50	7	1	2	2
South Dakota [4]	1	0	67	53	16	29	0	2
Nebraska	0	0	80	109	20	53	3	0
Kansas	1	0	144	154	48	79	1	2
South Atlantic States:								
Delaware	0	0	13	2	0	0	0	0
Maryland [2]	0	0	61	57	0	2	4	7
District of Columbia	0	0	29	40	0	2	0	0
Virginia	0	1			1	0		
West Virginia	0	0	42	51	36	80	13	8

[2] Week ended Friday.
[3] Exclusive of Tulsa.
[4] The report for New Mexico, p. 831, Public Health Reports, Apr. 6, 1928, was for the week ended Mar. 17, instead of Mar. 24, and that for South Dakota was for the week ended Mar. 24.
[5] Delayed report.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 9, 1927, and April 7, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928	Week ended Apr. 9, 1927	Week ended Apr. 7, 1928
South Atlantic States—Continued								
North Carolina	0	0	27	26	21	60	2	1
South Carolina	3	1	3	3	22	14	9	9
Georgia	0	0	17	18	0	0	4	6
Florida	0	0	9	9	65	7	4	3
East South Central States:								
Kentucky		0		74		40		0
Tennessee	0	1	36	25	9	27	3	5
Alabama	1	0	7	8	38	7	24	7
Mississippi	0	2	2	12	1	2	9	11
West South Central States:								
Arkansas	0	0	9	19	3	16	2	1
Louisiana	0	0	13	8	4	14	18	10
Oklahoma [3]	0	0	61	55	34	151	8	6
Texas	0	0	38	145	92	146	4	14
Mountain States:								
Montana	0	0	56	15	16	22	4	2
Idaho	0	0	19	11	7	8	0	3
Wyoming	0	0	16	31	0	2	0	0
Colorado	0	1	146	121	1	15	2	0
New Mexico [4]	0	1	12	15	3	3	1	0
Arizona	1	0	8	5	0	28	0	0
Utah [1]	0	0	8	5	4	12	1	0
Pacific States:								
Washington	0	1	91	48	44	38	3	9
Oregon	1	0	40	11	25	47	2	3
California	1	4	216	120	41	21	4	3

[1] Week ended Friday.
[3] Exclusive of Tulsa.
[4] The report for New Mexico, p. 831 Public Health Reports, Apr 6, 1928, was for the week ended Mar. 17 instead of Mar. 24, and that for South Dakota was for the week ended Mar. 24.

Report for Week Ended March 31, 1928

DISTRICT OF COLUMBIA

	Cases		Cases
Diphtheria	22	Scarlet fever	60
Influenza	1	Smallpox	1
Measles	229	Typhoid fever	1
Poliomyelitis	1		

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February, 1928										
Georgia	3	44	879	58	758	12	0	86	20	20
Massachusetts	7	496	57		7,174		13	1,400	0	15
New Hampshire	0	8	56				0	88	0	0
Pennsylvania	15	1,001			5,363	3	8	2,557	1	50
South Carolina	0	315	5,114	458	5,276	119	6	40	38	26
Virginia	1	122	3,918	64	3,905	15	7	298	20	27
Washington	18	60	48		1,219		8	278	288	11

February, 1928

	Cases
Actinomycosis:	
Massachusetts	1
Anthrax:	
Pennsylvania	1
Chicken pox:	
Georgia	21
Massachusetts	1,092
Pennsylvania	3,121
South Carolina	247
Virginia	737
Washington	420
Dengue:	
Georgia	1
South Carolina	5
Dysentery:	
Georgia	11
Pennsylvania	1
Virginia	53
German measles:	
Massachusetts	110
Pennsylvania	247
Washington	37
Hookworm disease:	
Georgia	5
South Carolina	120
Virginia	4
Impetigo contagiosa:	
Washington	4
Lead poisoning:	
Massachusetts	1
Pennsylvania	1
Lethargic encephalitis:	
Georgia	2
Massachusetts	9
Pennsylvania	8
Washington	2
Mumps:	
Georgia	81
Massachusetts	1,325

February, 1928—Continued

	Cases
Mumps—Continued	
Pennsylvania	4,257
South Carolina	9
Washington	349
Ophthalmia neonatorum:	
Massachusetts	149
Pennsylvania	18
South Carolina	19
Paratyphoid fever:	
South Carolina	4
Washington	3
Puerperal fever:	
Pennsylvania	2
Rabies in animals:	
South Carolina	15
Washington	1
Rabies in man:	
Pennsylvania	1
Scabies:	
Georgia	2
Washington	17
Septic sore throat:	
Georgia	51
Massachusetts	22
Tetanus:	
Massachusetts	2
Pennsylvania	4
Trachoma:	
Massachusetts	8
Tularaemia:	
Georgia	3
South Carolina	5
Whooping cough:	
Georgia	57
Massachusetts	1,079
Pennsylvania	1,361
South Carolina	308
Virginia	511
Washington	69

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 101 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,650,000. The estimated population of the 95 cities reporting deaths is nearly 31,000,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended March 24, 1928, and March 26, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	1,767	1,734	
101 cities	959	1,058	917
Measles:			
42 States	19,642	15,663	
101 cities	8,030	6,615	
Poliomyelitis:			
43 States	28	10	
Scarlet fever:			
43 States	4,936	5,949	
101 cities	1,869	2,516	1,404

	1928	1927	Estimated expectancy
Cases reported—Contd.			
Smallpox:			
43 States	1,383	1,186	
101 cities	149	181	130
Typhoid fever:			
43 States	131	255	
101 cities	27	50	46
Deaths reported			
Influenza and pneumonia:			
95 cities	1,452	1,128	
Smallpox:			
95 cities	0	0	

City reports for week ended March 24, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfacory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	6	1	1	0	0	4	16	2
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	1	0	0
Manchester	84,000	0	1	0	0	0	0	0	2
Vermont:									
Barre	[1] 10,008	1	0	0	0	0	0	1	0
Massachusetts:									
Boston	787,000	47	44	19	0	0	109	10	33
Fall River	131,000	2	3	4	0	0	1	2	2
Springfield	145,000	4	3	4	1	2	6	36	0
Worcester	193,000	8	4	8	0	0	29	63	6
Rhode Island:									
Pawtucket	71,000	1	1	2	0	0	6	27	3
Providence	275,000	3	8	6	0	0	69	20	10
Connecticut:									
Bridgeport	(2)	1	6	6	1	2	0	3	10
Hartford	164,000	9	7	2	2	0	12	5	5
New Haven	182,000	16	3	2	0	0	151	104	8
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	10	11	23	3	1	266	71	26
New York	5,924,000	241	233	316	57	27	1,330	40	278
Rochester	321,000	18	11	8	-------	0	38	38	11
Syracuse	185,000	31	5	0	--	0	108	13	6
New Jersey:									
Camden	131,000	2	5	7	3	3	52	0	6
Newark	459,000	33	12	27	18	0	425	24	20
Trenton	131,000	0	3	3	0	0	8	0	3
Pennsylvania:									
Philadelphia	2,008,000	85	74	53	1	10	123	114	108
Pittsburgh	637,000	45	20	13	0	4	204	94	39
Reading	114,000	3	3	6	0	0	5	0	5
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	9	8	12	0	7	150	0	21
Cleveland	960,000	54	27	56	39	5	57	230	32
Columbus	285,000	16	4	2	0	3	27	9	3
Toledo	295,000	24	4	0	2	2	375	15	11
Indiana:									
Fort Wayne	99,900	1	2	2	0	1	0	0	0
Indianapolis	367,000	28	7	6	0	2	75	126	19
South Bend	81,700	0	1	0	0	0	0	0	0
Terre Haute	71,900	5	1	0	0	1	0	0	3
Illinois:									
Chicago	3,048,000	123	77	111	51	16	38	45	166
Springfield	64,700	2	1	1	4	4	0	7	2
Michigan:									
Detroit	1,290,000	61	55	21	8	9	1,094	51	54
Flint	136,000	16	4	1	0	1	60	176	6
Grand Rapids	156,000	3	2	2	0	2	39	9	1

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended March 24, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha	52,700	21	1	0	0	0	0	0	0
Milwaukee	517,000	67	17	12	4	3	3	57	12
Racine	69,400	6	2	0	0	0	1	3	2
Superior	[1] 39,671	3	0	0	0	0	0	0	2
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	2	0	0	0	0	0	12	1
Minneapolis	434,000	90	15	19	0	1	80	296	19
St. Paul	248,000	13	12	3	0	0	0	68	10
Iowa:									
Davenport	[1] 52,469	4	1	0	0	-	1	0	-
Des Moines	146,000	0	2	1	0		0	0	-
Sioux City	78,000	6	1	0	0	-	4	94	-
Waterloo	36,900	4	0	0	0	-	6	10	-
Missouri:									
Kansas City	375,000	35	6	3	0	1	38	131	15
St. Joseph	78,400	4	0	1	0	0	0	11	3
St. Louis	830,000	19	40	38	3	1	240	21	
North Dakota:									
Fargo	[1] 26,403	2	1	0	0	0	0	4	0
Grand Forks	[1] 14,811	0	0	1	0		1	0	-
South Dakota:									
Aberdeen	[1] 15,036	9	0	0	0	-	0	0	-
Sioux Falls	[1] 30,127	0	0	0	0	-	0	0	-
Nebraska:									
Lincoln	62,000	15	1	2	0	0	0	34	0
Omaha	216,000	22	3	3	0	0	3	4	7
Kansas:									
Topeka	56,500	24	1	0	0	5	1	3	2
Wichita	92,500	20	2	1	0	0	0	0	1
SOUTH ATLANTIC									
Delaware:									
Wilmington	121,000	0	2	4	0	0	1	5	3
Maryland:									
Baltimore	808,000	89	28	18	22	5	910	18	52
Cumberland	[1] 33,741	2	1	0	3	0	1	0	3
Frederick	[1] 12,035	0	0	1	0	0	0	0	0
District of Columbia:									
Washington	528,000	26	11	21	11	11	182	0	22
Virginia:									
Lynchburg	30,500	1	1	5	0	0	34	0	4
Norfolk	174,000	28	1	0	0	0	69	1	9
Richmond	189,000	9	2	4	0	2	180	2	6
Roanoke	61,900	1	1	2	0	0	12	1	5
West Virginia:									
Charleston	50,700	2	1	0	0	0	1	0	0
Wheeling	[1] 56,208	1	1	0	0	0	7	1	1
North Carolina:									
Raleigh	[1] 30,371	6	0	0	0	0	57	0	1
Wilmington	37,700	8	0	0	0	0	14	0	3
Winston-Salem	71,800	7	0	4	0	0	96	15	3
South Carolina:									
Charleston	74,100	0	0	0	17	1	2	0	1
Columbia	41,800	1	0	0	0	0	24	19	2
Greenville	[1] 27,311	0	0	0	0	0	2	1	3
Georgia:									
Atlanta	(2)	17	0	5	37	2	17	9	7
Brunswick	[1] 16,809	0	0	0	0	0	37	1	2
Savannah	94,900	5	0	0	17	0	4	3	8
Florida:									
Miami	[1] 69,754	17	3	4	0	0	0	7	7
St. Petersburg	[1] 26,847	-	0	-	-	0	-	-	0
Tampa	102,000	9	1	0	0	1	0	6	2

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended March 24, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	7	1	0	0	0	12	0	5
Louisville	311,000	2	3	4	6	4	92	16	17
Tennessee:									
Memphis	177,000	18	4	6	0	1	45	27	11
Nashville	137,000	2	0	2	0	5	23	2	3
Alabama:									
Birmingham	211,000	25	2	0	32	5	67	5	10
Mobile	66,800	4	1	0	1	2	0	0	0
Montgomery	47,000	11	0	0	0	------	44	1	--------
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	2	1	0	0	------	0	0	--------
Little Rock	75,900	0	1	0	4	5	27	1	11
Louisiana:									
New Orleans	419,000	8	8	6	10	3	0	0	14
Shreveport	59,700	8	1	1	0	3	166	2	7
Oklahoma:									
Oklahoma City	(2)	1	2	3	12	0	35	0	10
Tulsa	133,000	27	1	1	0	------	0	24	--------
Texas:									
Dallas	203,000	26	5	3	16	5	5	0	4
Fort Worth	159,000	21	2	8	0	0	5	2	8
Galveston	49,100	0	0	2	0	0	17	0	2
Houston	[1] 164,954	11	3	12	0	1	43	0	15
San Antonio	205,000	3	2	5	0	7	22	0	14
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	0
Great Falls	[1] 29,883	0	1	0	0	1	1	0	0
Helena	[1] 12,037	0	0	0	0	0	0	0	1
Missoula	[1] 12,668	0	1	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	0	0	0	0	0	0	0	0
Colorado:									
Denver	285,000	49	9	8	------	10	37	137	11
Pueblo	43,900	12	1	0	0	1	12	0	2
New Mexico:									
Albuquerque	[1] 21,000	6	0	0	0	0	28	0	0
Utah:									
Salt Lake City	133,000	11	2	1	0	3	7	10	5
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	40	5	1	0	------	184	5	--------
Spokane	109,000	3	2	0	0	------	0	0	--------
Tacoma	106,000	27	1	1	0	0	6	61	1
Oregon:									
Portland	[1] 282,383	31	8	4	2	0	24	2	8
California:									
Los Angeles	(2)	154	44	35	22	1	47	81	21
Sacramento	73,400	9	1	0	0	0	9	9	1
San Francisco	567,000	86	21	4	1	1	70	43	7

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended March 24, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine											
Portland	4	5	0	0	0	0	0	0	0	10	22
New Hampshire											
Concord	1	0	0	0	0	1	0	0	0	0	13
Manchester	3	0	0	0	0	2	0	0	0	0	22
Vermont											
Barre	0	1	0	0	0	0	0	0	0	0	3
Massachusetts											
Boston	82	7[illegible]	0	0	0	15	1	2	0	59	227
Fall River	4	12	0	0	0	4	0	1	0	0	33
Springfield	6	29	0	0	0	1	0	0	0	7	35
Worcester	11	4	0	0	0	4	0	0	0	8	67
Rhode Island											
Pawtucket	2	4	0	0	0	0	0	0	0	0	11
Providence	9	37	0	0	0	5	0	0	0	5	86
Connecticut											
Bridgeport	13	4	0	0	0	1	0	0	0	5	45
Hartford	6	6	0	0	0	2	0	0	0	7	38
New Haven	10	2	0	0	0	0	0	1	0	30	46
MIDDLE ATLANTIC											
New York											
Buffalo	23	44	0	0	0	6	1	1	0	26	153
New York	297	492	0	0	0	143	8	6	0	142	1,751
Rochester	16	11	0	0	0	3	1	0	0	7	99
Syracuse	13	6	0	0	0	2	0	0	0	33	44
New Jersey											
Camden	7	8	0	0	0	2	0	0	0	2	38
Newark	34	44	0	0	0	10	1	0	0	29	120
Trenton	4	1	0	0	0	4	0	0	0	1	42
Pennsylvania											
Philadelphia	88	101	0	0	0	31	3	0	0	78	568
Pittsburgh	31	26	0	0	0	12	1	1	0	11	199
Reading	4	32	0	0	0	1	0	0	0	0	33
EAST NORTH CENTRAL											
Ohio											
Cincinnati	19	28	1	2	0	9	0	1	0	6	181
Cleveland	41	30	1	0	0	17	2	0	0	60	234
Columbus	11	12	2	0	0	6	0	1	1	3	67
Toledo	14	11	3	0	0	3	0	2	1	4	69
Indiana											
Fort Wayne	6	11	2	0	0	1	0	0	0	1	24
Indianapolis	9	15	11	5	0	9	0	0	0	4	110
South Bend	4	2	0	0	0	0	0	0	0	2	15
Terre Haute	3	1	0	11	0	1	0	0	0	0	37
Illinois											
Chicago	130	151	3	2	0	58	2	0	0	117	897
Springfield	2	14	0	2	0	0	0	1	0	1	26
Michigan											
Detroit	97	129	1	1	0	21	1	0	0	69	345
Flint	7	9	0	4	0	2	0	0	0	15	31
Grand Rapids	9	5	1	0	0	1	0	1	0	4	32
Wisconsin											
Kenosha	3	1	0	0	0	0	0	0	0	1	5
Milwaukee	28	47	2	0	0	4	0	0	0	18	115
Racine	4	5	1	0	0	0	0	0	0	11	8
Superior	4	7	2	0	0	0	0	0	0	0	14
WEST NORTH CENTRAL											
Minnesota											
Duluth	9	14	1	0	0	1	0	0	0	1	18
Minneapolis	54	27	5	0	0	8	1	0	0	17	98
St. Paul	33	12	5	0	0	3	0	0	0	27	69
Iowa											
Davenport	1	2	3	0	-------	-------	0	0	-------	0	-------
Des Moines	7	10	1	5	-------	----	0	0	-------	0	86
Sioux City	2	1	2	0	-------	-------	0	0	-------	1	-------
Waterloo	2	7	0	4	-------	-------	0	0	-------	1	-------

City reports for week ended March 24, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL—continued											
Missouri:											
Kansas City	11	46	4	12	0	9	0	0	0	14	124
St. Joseph	3	2	0	9	0	0	0	0	0	1	41
St. Louis	38	23	5	7	0	19	2	0	0	25	307
North Dakota:											
Fargo	2	3	0	0	0	1	0	0	0	10	7
Grand Forks	1	2	1	0	----	----	0	0	----	0	----
South Dakota:											
Aberdeen	4	0	0	0	----	----	0	0	----	7	----
Sioux Falls	2	2	0	0	----	----	0	0	----	0	----
Nebraska:											
Lincoln	3	3	0	4	0	0	0	0	0	12	9
Omaha	4	7	8	1	0	5	0	0	0	2	69
Kansas:											
Topeka	2	1	1	11	0	1	0	0	0	5	25
Wichita	2	7	1	20	0	1	0	0	0	5	35
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	2	0	0	0	2	0	0	0	0	24
Maryland:											
Baltimore	10	34	0	0	0	16	2	0	0	85	275
Cumberland	1	1	0	0	0	0	0	0	0	0	17
Frederick	0	0	0	0	0	0	0	0	0	0	2
District of Columbia:											
Washington	26	44	2	2	0	14	1	1	0	13	177
Virginia:											
Lynchburg	0	1	1	0	0	1	0	0	0	12	16
Norfolk	1	10	0	0	0	2	0	0	0	1	----
Richmond	2	9	0	0	0	4	0	0	0	2	62
Roanoke	1	2	1	0	0	0	0	0	0	1	22
West Virginia:											
Charleston	0	7	1	1	0	0	0	0	0	0	3
Wheeling	2	1	0	0	0	1	0	1	0	0	19
North Carolina:											
Raleigh	0	1	0	3	0	0	0	0	0	2	13
Wilmington	1	2	0	0	0	1	0	0	0	2	20
Winston-Salem	0	0	5	0	0	1	0	0	0	0	23
South Carolina:											
Charleston	0	0	0	0	0	1	0	0	0	0	28
Columbia	0	1	1	0	0	0	0	0	0	4	17
Greenville	0	0	1	0	0	1	0	0	0	1	13
Georgia:											
Atlanta	4	9	5	2	0	4	1	1	1	4	76
Brunswick	0	0	0	0	0	1	1	0	0	0	6
Savannah	0	1	1	4	0	1	0	1	0	0	38
Florida:											
Miami	2	0	0	0	0	3	1	0	0	5	39
St. Petersburg	0	----	0	----	0	1	0	----	0	----	18
Tampa	0	3	0	1	0	2	0	2	0	0	17
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	2	0	0	0	2	0	0	0	0	29
Louisville	6	25	0	0	0	5	1	0	0	1	88
Tennessee:											
Memphis	4	7	4	1	0	6	1	0	0	1	76
Nashville	3	1	1	1	0	1	1	0	0	2	54
Alabama:											
Birmingham	2	7	8	1	0	4	1	0	0	1	67
Mobile	0	4	1	2	0	0	0	1	0	0	25
Montgomery	0	1	0	0	----	----	0	0	----	0	----
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0	----	----	0	0	----	0	----
Little Rock	1	2	0	1	0	3	0	0	0	0	----

City reports for week ended March 24, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL—contd											
Louisiana											
New Orleans	7	4	1	0	0	16	2	2	1	3	158
Shreveport	1	1	1	2	0	1	1	0	0	4	44
Oklahoma											
Oklahoma City	2	3	3	20	0	1	0	0	0	0	31
Tulsa	0	12	2	4			1	0		0	---
Texas											
Dallas	3	22	5	5	0	2	0	0	0	3	71
Fort Worth	1	8	2	9	0	2	0	0	0	0	38
Galveston	0	1	1	0	0	1	1	0	0	0	21
Houston	2	1	2	1	0	3	0	0	0	0	52
San Antonio	0	0	0	0	0	9	1	0	0	0	85
MOUNTAIN											
Montana											
Billings	1	1	1	0	0	0	0	0	0	0	6
Great Falls	1	0	0	2	0	0	0	0	0	[illegible]	11
Helena	0	0	0	3	0	0	0	0	0	0	5
Missoula	1	0	0	0	0	0		0	0	0	7
Idaho											
Boise	1	0	1	0	0	0	0	0	0	0	8
Colorado											
Denver	13	15	2	0	0	5	1	0	1	19	99
Pueblo	1	2	1	1	0	1	0	0	0	0	16
New Mexico											
Albuquerque	1	0	0	0	0	6	0	0	0	0	15
Utah											
Salt Lake City	2	2	1	1	0	0	0	0	0	11	32
Nevada											
Reno	0	0	0	0	0	0	0	0	0	0	7
PACIFIC											
Washington											
Seattle	10	7	4	1		0	1		0	9	----
Spokane	7	4	6	14		0	0		0	0	---
Tacoma	2	0	5	0	0	1	0	0	0	1	18
Oregon											
Portland	7	5	8	43	0	2	0	0	0	0	80
California											
Los Angeles	29	34	4	7	0	32	1	0	0	24	----
Sacramento	2	3	0	1	0	2	1	1	0	2	28
San Francisco	16	31	4	1	0	7	1	1	0	22	166

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts									
Boston	1	0	0	0	0	0	0	0	0
Springfield	1	1	0	0	0	0	0	0	0
Connecticut									
Bridgeport	1	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York									
New York	27	14	3	4	0	0	1	3	2
Pennsylvania									
Philadelphia	0	0	1	1	0	0	0	0	0
Pittsburgh	2	0	0	0	0	0	0	0	0

City reports for week ended March 24, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cleveland	1	2	0	0	0	0	0	0	0
Illinois:									
Chicago [1]	10	6	1	0	0	0	0	1	0
Michigan:									
Detroit	4	2	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee	2	2	1	1	0	0	0	0	0
Racine	0	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
Iowa:									
Davenport	0	0	1	0	0	0	0	0	0
Missouri:									
Kansas City	4	2	0	0	1	1	0	1	0
St. Louis	2	1	0	0	0	0	0	0	0
SOUTH ATLANTIC									
District of Columbia:									
Washington	1	0	0	0	0	0	0	1	0
North Carolina:									
Winston-Salem	0	0	0	0	1	1	0	0	0
South Carolina:									
Charleston	0	0	0	0	2	0	0	0	0
Georgia:									
Savannah	0	0	0	0	2	1	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Birmingham	2	0	0	0	2	0	1	0	0
Mobile	0	0	0	0	0	1	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	0	0	2	0	0	0	0
Shreveport	0	0	0	0	0	1	0	0	0
Texas:									
Dallas	0	0	0	1	0	0	0	0	0
Houston	0	1	0	0	0	0	0	0	0
MOUNTAIN									
Montana:									
Great Falls	1	0	0	0	0	0	0	0	0
Colorado:									
Denver	5	2	0	0	0	0	0	0	0
Pueblo	4	0	0	0	0	0	0	0	0
Utah:									
Salt Lake City	4	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Spokane	2	0	0	0	0	0	0	0	0
Tacoma	0	0	0	0	0	0	0	1	0
Oregon:									
Portland	1	0	0	0	0	0	0	0	0
California:									
Los Angeles	2	0	0	0	0	0	0	0	0
San Francisco	1	0	5	1	0	0	0	0	0

[1] Rabies (in man): 1 case and 1 death at Chicago, Ill.
[2] Tularaemia: 3 cases at Savannah, Ga.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended March 24, 1928, compared with those for a like period ended March 26, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of these cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, February 19 to March 24, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

	Week ended—									
	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928
DIPHTHERIA CASE RATES										
101 cities	179	174	182	172	183	172	176	[2] 158	178	158
New England	149	138	163	140	128	145	137	[3] 136	130	124
Middle Atlantic	199	224	223	233	230	214	240	212	226	222
East North Central	198	169	176	164	165	171	157	135	178	148
West North Central	109	125	115	113	133	131	127	[4] 118	121	132
South Atlantic	191	156	195	130	155	124	141	139	146	112
East South Central	117	35	81	90	112	85	30	[5] 112	41	60
West South Central	194	188	119	92	190	168	161	136	174	116
Mountain	72	71	233	186	197	97	126	106	81	80
Pacific	151	161	133	141	198	171	165	125	193	105
MEASLES CASE RATES										
101 cities	862	998	880	1,126	952	1,131	929	[2] 1,350	943	1,326
New England	228	1,908	172	1,979	198	1,657	212	[3] 2,277	198	1,536
Middle Atlantic	74	877	67	1,000	80	970	93	1,213	114	1,393
East North Central	1,015	565	1,173	761	1,169	865	1,233	1,063	1,138	1,009
West North Central	960	255	952	341	1,241	489	1,560	[4] 582	1,514	725
South Atlantic	651	2,403	794	2,576	783	2,784	1,010	2,972	972	2,893
East South Central	461	1,202	538	1,541	314	1,307	441	[5] 1,980	436	1,426
West South Central	591	1,959	720	1,695	1,187	1,300	1,026	1,328	1,754	1,120
Mountain	10,624	168	8,132	142	9,091	283	5,397	345	5,074	504
Pacific	2,865	749	3,030	892	8,252	904	2,923	830	8,163	807
SCARLET FEVER CASE RATES										
101 cities	424	295	418	295	446	303	431	[2] 300	423	309
New England	542	414	423	347	591	377	546	[3] 404	479	411
Middle Atlantic	531	335	532	345	583	358	572	352	580	374
East North Central	366	255	399	309	369	292	353	296	347	306
West North Central	445	275	443	261	471	290	426	[4] 279	400	292
South Atlantic	218	282	180	254	193	268	220	223	179	224
East South Central	183	185	218	214	279	250	208	[5] 165	162	234
West South Central	116	120	66	96	120	128	62	208	58	124
Mountain	1,192	203	1,076	257	1,112	195	1,336	248	1,130	177
Pacific	813	233	329	194	285	192	253	217	360	202

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] Barre, Vt., Sioux City, Iowa, and Mobile, Ala., not included.
[3] Barre, Vt., not included.
[4] Sioux City, Iowa, not included.
[5] Mobile, Ala., not included.

Summary of weekly reports from cities, February 19 to March 24, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SMALLPOX CASE RATES

	Week ended—									
	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928
101 cities	25	24	21	17	30	22	31	[2] 21	30	23
New England	0	0	0	0	0	0	0	[3] 0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	15	13	21	18	34	14	33	26	29	18
West North Central	63	92	53	62	53	92	49	[4] 62	69	125
South Atlantic	45	26	52	19	54	25	51	33	41	23
East South Central	71	40	122	0	81	20	132	[5] 21	106	25
West South Central	50	8	50	20	70	36	45	44	74	30
Mountain	0	62	0	53	0	115	90	53	18	62
Pacific	104	125	13	49	94	69	84	38	99	61

TYPHOID FEVER CASE RATES

	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928
101 cities	8	5	9	10	8	4	7	[2] 4	8	4
New England	9	7	2	0	12	2	5	[3] 7	5	9
Middle Atlantic	1	5	5	8	8	3	6	2	7	4
East North Central	6	1	6	7	1	4	4	3	4	3
West North Central	8	4	10	6	4	2	0	[4] 4	4	0
South Atlantic	29	9	23	12	11	9	11	11	13	11
East South Central	25	20	41	50	30	5	20	[5] 11	41	5
West South Central	4	16	8	32	17	4	12	12	29	8
Mountain	18	0	9	9	0	0	9	0	0	0
Pacific	8	5	8	8	10	3	18	5	10	5

INFLUENZA DEATH RATES

	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928
95 cities	22	21	25	24	27	22				
New England	12	7	9	7	12	21	19	[3] 7	7	9
Middle Atlantic	22	24	24	16	25	19	31	26	26	22
East North Central	17	14	23	17	16	16	18	12	16	35
West North Central	10	2	17	10	14	12	21	16	14	16
South Atlantic	41	28	47	32	70	25	79	19	65	30
East South Central	43	31	21	84	80	12	90	[5] 73	96	89
West South Central	25	74	38	103	47	74	21	115	25	98
Mountain	54	35	54	88	54	62	18	80	27	133
Pacific	17	20	17	24	7	20	14	10	28	7

PNEUMONIA DEATH RATES

	Feb. 26, 1927	Feb. 25, 1928	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928
95 cities	163	161	171	190	188	191	184	[6] 221	167	213
New England	184	147	202	193	188	205	172	[3] 238	156	182
Middle Atlantic	176	155	193	217	222	221	226	258	198	245
East North Central	145	156	132	148	157	156	142	194	141	211
West North Central	91	71	104	106	81	96	114	139	101	118
South Atlantic	253	228	229	217	272	214	202	214	218	240
East South Central	122	220	271	240	186	272	101	[5] 331	197	240
West South Central	161	271	183	263	161	254	195	263	136	275
Mountain	134	248	126	265	170	265	161	203	170	168
Pacific	131	115	121	155	148	122	93	125	110	101

[2] Barre, Vt., Sioux City, Iowa, and Mobile, Ala, not included.
[3] Barre, Vt., not included.
[4] Sioux City, Iowa, not included.
[5] Mobile, Ala., not included.
[6] Barre, Vt., and Mobile, Ala., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended March 10, 1928.—The following report for the week ended March 10, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

Egypt.—Suez.
Aden Protectorate.—Aden.
India—Bassein, Bombay, Rangoon.
Ceylon.—Colombo.
Straits Settlements.—Singapore.
Siam.—Bangkok.

CHOLERA

India.—Bombay, Calcutta, Rangoon.
Siam.—Bangkok.
French Indo-China. Saigon, Tourane.

Iraq.—Basrah.
India.—Bombay, Calcutta, Madras, Negapatam, Rangoon, Vizagapatam.
French India Pondicherry.
French Indo-China.—Saigon.
Dutch East Indies.—Belawan-Deli, Banjermasin, Pontianak.
China.—Shanghai, Hong Kong.
Korea.—Fusan.

Returns for the week ended March 10 were not received from the following ports:

Dutch East Indies—Samarinda.
Kwantung Port Arthur, Dairen.
Towns of the South Manchurian Railway Zone.
Union of Socialist Soviet Republics. Vladivostok.

ARABIA

Aden Protectorate—Plague.—Information received under date of March 7, 1928, shows spread of the plague epidemic which has been reported present in the Aden Protectorate, Arabia, since the first week in January, 1928, with 464 cases and 294 deaths reported to March 7, 1928. It was stated that about one-fourth of the native population of Aden had fled to the interior.

CANADA

Communicable diseases—Provinces—Week ended March 17, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases in six Provinces of Canada for the week ended March 17, 1928, as follows:

Disease	Nova Scotia	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Influenza	28		1		6		35
Poliomyelitis			1				1
Smallpox			19		14	7	40
Typhoid fever		20	4			5	29

Quebec Province—Communicable diseases—Week ended March 24, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended March 24, 1928, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Scarlet fever	70
Chicken pox	22	Smallpox	40
Diphtheria	43	Tuberculosis	31
German measles	12	Typhoid fever	8
Influenza	8	Whooping cough	21
Measles	209		

Vancouver, British Columbia—Smallpox.—Smallpox in epidemic form has been reported in Vancouver, British Columbia, and its vicinity. On April 3, 1927, there were said to be 50 cases.

ECUADOR

Vital statistics—Health conditions.—Information received under date of February 18, 1928, shows the population of Ecuador, estimated as of December 31, 1925, to be about 2,000,000.

In 1925, 88,943 births were registered in Ecuador, or 44.5 per 1,000 population, and there were 15,237 deaths of infants under one year of age, the infant mortality rate being 171.3 per 1,000 births. In 1926, the death rate was 24.18 per 1,000 population in Ecuador. In Quito, with a population of about 100,000, the birth rate was 34.5 per 1,000 in 1926, and the death rate was 20 per 1,000.

The cities of Quito, Guayaquil, Ambato, Riobamba, Ibarra and Cuenca have municipal water supplies derived from springs or small streams.

Quito and Ambato are stated to have sewerage systems which are nearly completed; those of Guayaquil, Ibarra, and Latacunga are only partially constructed. In Riobamba and Cuenca sewage and surface waters are carried by open ditches through the streets.

Disease prevalence.—Prevalence of certain diseases in Ecuador is stated as follows:

Dysentery is common throughout the country.

Hookworm infection exists in the coastal region, but the index of occurrence has not been determined.

Leprosy is stated to be frequent, but, not being considered dangerous, receives little attention.

Malaria exists only in certain zones, including almost all of the coastal region.

Plague is stated to be always present at Guayaquil.

Typhoid fever is prevalent in many parts of Ecuador, especially in the interior.

Tuberculosis is said to be prevalent both in the lowlands and in the high interior of Ecuador.

GREAT BRITAIN

Scotland—Vital statistics, 1927.—The Registrar-General of Scotland has published the following statistics for Scotland for the year 1927:

	Number	Rates per 1,000 population		Number	Rates per 1,000 population
Births	96,669	19.75	Deaths—Continued.		
Illegitimate births	6,952	----	Influenza	2,026	.41
Marriages	32,589	6.66	Lethargic encephalitis	117	.02
Deaths:			Measles	660	.13
Total	65,830	13.45	Pneumonia (all forms)	5,894	1.20
Apoplexy	6,053	1.24	Puerperal sepsis	184	.04
Bronchitis	3,914	.80	Scarlet fever	200	.04
Cancer	6,918	1.41	Tuberculosis of respiratory system	3,466	.71
Cerebrospinal meningitis	138	.03	Tuberculosis (other forms)	1,401	.29
Diarrhoea and enteritis under 2 years	698	.14	Typhoid fever	41	.01
Diphtheria	485	.10	Typhus fever	2	----
Heart disease	7,900	1.61	Whooping cough	850	.17

The birth rate for the year in Scotland was 19.8 per thousand population. This is the lowest birth rate ever recorded in that country.

The infant mortality rate for the year was 89 per thousand live births. The mean of the infant mortality rates of the preceding five years was 90 per thousand births.

MADAGASCAR

Plague—December 16-31, 1927.- During the period December 16 to 31, 1927, 217 cases of plague with 184 deaths were reported in the island of Madagascar. The occurrence was distributed according to Provinces as follows: Ambositra, cases, 18, deaths, 10; Antisirabe, cases, 38, deaths, 38; Itasy, cases, 37, deaths, 30; Moramanga, cases, 8, deaths, 8; Tananarive, cases, 116, deaths, 98, of which 17 cases with 12 deaths occurred in the town of Tananarive. The distribution of occurrence according to type was: Bubonic, cases, 153, deaths, 120; pneumonic, cases, 46, deaths, 46; septicemic, cases, 18, deaths, 18.

Certain localities officially declared infected.—Information dated February 6, 1928, indicates that certain localities in the island of Madagascar have been officially declared infected and that sanitary restrictions have been ordered enforced. These localities are situated in the Provinces of Ambositra and Antisirabe. The town of Antisirabe is the sole resort and watering place in the island, having natural hot springs, government controlled.

92565°—28——4

SPAIN

Madrid—Mortality from communicable diseases—January-February, 1928.—During the months of January and February, 1928, mortality from communicable diseases was reported at Madrid, Spain, as follows:

Disease	Deaths	
	January, 1928	February, 1928
Diphtheria	2	1
Influenza	6	8
Measles	22	20
Scarlet fever	1	1
Tuberculosis	150	159
Typhoid fever	3	11

Population, 766,552.

Mortality from all causes.—The total number of deaths from all causes reported in Madrid was for January, 1928, 1,587, and for February, 1928, 1,490.

SYRIA

Beirut and the Lebanon—Smallpox—January 26-March 4, 1928.—During the period January 26 to March 4, 1928, 73 cases of smallpox were reported at Beirut, Syria, and 31 cases at other localities in the Lebanon.

UNION OF SOUTH AFRICA

Plague—Cape Province—Orange Free State—February 12-18, 1928.—During the week ended February 18, 1928, plague was reported in the Union of South Africa as follows: Cape Province—suspect case, native, in the Philipstown District; Orange Free State—three suspect cases, native, fatal, reported during week ended February 11, 1928, confirmed, and three further cases, native, with one fatality, occurring in the same locality, a farm in Heilbron District. A fatal case, native, was reported in a contact of one of the cases reported during the week ended February 11, 1928.

Typhus fever.—Fresh outbreaks of typhus fever were reported occurring in two districts of the Cape Province, in one district of Natal, and one district of Orange Free State.

During the month of January, 1928, there were reported in the Union of South Africa 50 cases of typhus fever. Of these, 48 cases with 13 deaths occurred among the native population, distributed as follows:

Cape Province, cases, 45; deaths, 13.

Natal, Orange Free State, and Transvaal, each one case. The two cases occurring in the white or European population were reported in the Cape Province.

VENEZUELA

Caracas—Communicable diseases—January, 1928.—During the month of January, 1928, mortality from communicable diseases at Caracas was reported as follows:

Disease	Deaths	Disease	Deaths
All causes	265	Diarrhea and enteritis (2 years and over)	13
Cerebrospinal meningitis	2	Tuberculosis	41
Diphtheria	2	Typhoid fever	2
Diarrhea and enteritis (under 2 years)	21		

YUGOSLAVIA

Communicable diseases—February, 1928.—During the month of February, 1928, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	17	3	Poliomyelitis	1	
Cerebrospinal meningitis	6	4	Rabies	1	1
Diphtheria	208	41	Scarlet fever	1,583	235
Dysentery	25	5	Tetanus	12	6
Leprosy	1		Typhoid fever	104	31
Measles	3,406	44	Typhus fever	24	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug 27, 1927	Aug 28–Sept 24, 1927	Sept 25–Oct 22, 1927	Oct 23–Nov 19, 1927	Nov. 20–Dec 17, 1927	Week ended— December, 1927: 24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	March, 1928: 3	10
China:																				
Amoy	C	28	72	16																
	D	7	3																	
Canton	C	31	36	14	12	1														
	D	16	25	14	11	1														
Foochow	C	P	P	P																
Hong Kong	C	P	1	P																
Shanghai (settlement and concession)—																				
Foreigners only	C	1	6	3																
Including natives	D	20	4	7																
Swatow	C	42	P	P	P															
	D		P	P	P															
Tientsin	C	P	15	2	P	1														
Dutch East Indies: Java—Batavia	C				28	3														
	D				18	3														
India	C	45,163	31,390	20,160	23,047	27,159	4,624	3,960	3,560	3,243	3,267	3,097								
	D	22,051	15,895	10,371	12,863	17,026	2,617	2,353	2,046	1,817	1,765	1,[illegible]59								
Bassein	D												1			1	1			
Bombay	C	42	3		2							1								
	D	30	2		2													1		
Calcutta	C	87	76	101	199	425	69	43	43	22	39	36	70	58						
	D	40	39	64	138	251	48	34	27	16	18	24	38	32	35	42	63	101		
Madras	C	547	59	14	13	1				1	1			1		3				
	D	278	48	8	7	2				1		3		1	2	2	7	7		
Madras Presidency	C	7,660	3,056	2,050	3,073	3,702	503	382	482	497	1,163	1,301								
	D	3,513	1,581	1,055	1,736	2,104	241	209	254	250	623	813								
Negapatam	C										4									
	D										4	1		1	2	2				
Rangoon	C	1	2	6	2	8	1	2		1	4		1	1	10					
	D	1	2	5	5	6	1	1		1			1	1	8	4	2	4		
Tuticorin	C			1		8														
	D			1	37	14														

India (French):																		
Chandernagor	C	1	1		6	10	6	3	4	1	1		5					
	D	1			6	10	4	2	2	1			1					
Karikal	C	18	1		1	1			6	2	3	7	8					
	D	12	1		1	1			4		5	4	5					
Pondicherry	C	12	15		1	25	4	1	2	4	2	3	2					
	D	11	15		1	21	6	1	2	3	2	3	2					
Indo-China: Saigon	C		1	1					2	1	1	1		2	1	5		8
	D								1					1	1	1		6
Iraq [1]																		
Philippine Islands: Manila		1																
Siam	C	77	40	18	110	88	24	24	13	49	50	33	48	69	74			
	D	53	24	11	76	64	18	21	5	36	34	21	42	42	50			
Bangkok	C	2	3	5	4	3	2	3	7	9	11	28	28	34	23	17	12	
	D	1	1	3	2	2	2	1	3	5	7	16	26	17	12	11	7	
Straits Settlements: Singapore	C				7	5	3	15	3	2	2			1				
	D				5	4	1	4	5	2	1							
On vessel:																		
S. S. Adrastus: At Yokohama, Japan	C	1																
	D	1																
S. S. Tabaristan: At Basra, Iraq	C			1														

Place		July–September	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928		
				1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20	21–31	1–10	11–20	21–29
Indo-China (French):															
Annam	C	3,179	226	13	75	38	16	2		79	95	93	23	36	14
Cambodia	C	251	180	56	1	28	21	12	39	30	9	15	38	22	51
Cochin-China	C	469	178	21	27	52	17	38	58	46	119	130	178	113	153
Laos	C	246	67	10											
Tonkin	C	1,297	1			1			2	1					
Kwangchow-wan	C	16													

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927: 24	December, 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17
Algeria: Oran	C	4	1		2														
	D	3	1																
Arabia: Aden	C									19	13	22	54	89	63	45	77	158	
	D									7	8	8	33	55	50	31	26	99	
Argentina:																			
Bahia Blanca district	C					3													
Buenos Aires	C													2					
Cordoba Province	C	2		P	P	10	1	1											
Entre Rios	C	5																	
Firmat	C					1													
Quilino	C					3													
Rosario	C					4	2	3				4			1				
Santiago Province	C														1				
Ucacha	C					1													
Azores: St. Michaels Island	C	2	2	3	3	3	1		1		3	1	2	2					
	D		1	1		1				1	1	1	1	1	1				
Brazil:																			
Bahia	C							1	2	1	2		2	1	4				
	D							1	1	2		1	2	1	2				
Porto Alegre																	2		
Rio de Janeiro	C										1		1	2	1	1			
	D													1	2				
British East Africa:																			
Tanganyika	C	P		P	P	P	P						2						
	D												2						
Uganda	C	456	226	99	99	67													
	D	345	158	88	96	61													
Canary Islands:																			
Las Palmas [1]	C			9		3			2	1	1				1				2
	D					1				1	1				1				
Teneriffe	C										1	3	3	3					
	D										1		3						

Ceylon: Colombo	C	1	3	1		6	3	2	1	1	1	1	1		3	3	4	1	
	D		3			6	3	1	1	1	1	1			1	3	1	1	
China:																			
Tientsin	C	2																	
*Tungliao	D			200															
Dutch East Indies:																			
Balik-Papan	C						1												
	D						1												
Celebes—Makassar	C				6	2	2	1		3	2	1	1	1		1			
	D				6	2	2	1		2	2	1	1	1		1			
Java	D		432	779	829	1,017	209	179	176	187									
Batavia and West Java	C	71	68	130	132	154	32	36	24	36	46	37	27	31					
	D	71	68	129	132	152	32	36	24	36	44	37	27	31					
Cheribon	C					1													
	D					1													
East Java and Madura	C	28	18	17	10	8	3	2	1	1	5	2					P		
	D	27	18	17	10	8	3	2	1	1	5	2							
Pasoeroean Residency	C					P													
Surabaya Residency	C					P													
Surakarta Residency	C				P	P													
Egypt:																			
Alexandria	C	2	1			12	3	2					1		1				
	D					7	1	1					1		1				
Cairo	C							2											
	D							2											
Suez	C		1							1	1		3		3	4		3	
	D									1	1		1		3	3	2	1	
Greece:																			
Athens and Piræus	C	1	3	1				2	1										
	D			1				1											
Mitylene	C	1	5	1	3	3													
Patras	C	2	2	1	1														
	D			1	1														
Hawaii Territory: Hawaii	D	1													1				
India	C	1,391	2,710	3,246	3,600	5,518	1,065	1,197	2,596	2,219	2,544	2,699							
	D	836	1,428	1,792	2,065	3,269	733	899	1,804	1,498	1,653	1,661							
Bassein	D	12	14	8	4	4	2	13	2		3	3		2	1	2	4	5	
Bombay	C	14	7	4				1		2	5	4	2	3	5				
	D	11	5	3				1		1	2	2	3	2	6	14	7	6	
Calcutta	C		18																
	D		10									1							
Madras Presidency	C	620	465	583	470	791	174	167	56	153	107	132	79						
	D	321	230	298	282	359	69	27	38	72	63	64	60						
Rangoon	C	15	6	11	11	15	2	4	4	7	8	9	7	11	15				
	D	14	6	11	11	15	2	3	4	7	7	7	6	10	12	15	6	10	
Indo-China: Saigon	C		2		1														
Iraq:																			
Baghdad	C										1	1		2		1			
	D										1			1		1	1		
Dulaim Liwa	C												1						

[1] 2 cases of plague were reported at Las Palmas, Canary Islands, Mar. 29, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927 24	December, 1927 31	January, 1928 7	January, 1928 14	January, 1928 21	January, 1928 28	February, 1928 4	February, 1928 11	February, 1928 18	February, 1928 25	March, 1928 3	March, 1928 10	March, 1928 17
Nigeria: Lagos	C				17	13	2	1	1	6	2	3	3	2	2	3	2		
	D				17	13	1	1	1	5	3	3	3	2	2	3	2		
Senegal:[1]																			
Baol	C	23	72	95	P	P													
	D	13	33	40															
Cayor	C	227	463	176	48														
	D	166	233	88	28														
Dakar	C	46	20	1															
	D	32	12																
Louga	C		5	8															
	D		4																
Rufisque	C	44	16																
	D	38	12																
Thies	C		9	1	1														
	D		7																
Siam	C			13	1	3	1		4	4	5	3	6		13				
	D			9		2	1	1	5	4	1	1	5		10				
Bangkok	C			2				1				1	1		1				
	D				1			1				1	1		1				
Straits Settlements: Singapore	C				1								1	1	1		1		
	D				1								1	1	1				
Tunisia[2]																			
Turkey: Constantinople	C		1	1		2													
	D			1		1													
Union of South Africa:																			
Cape Province	C				2	2					1								
	D				2	1					1								
Orange Free State	C				1	8						2		3					
	D				1	6						1		3					
U. S. S. R.:																			
Chita district	C			1															
	D			1															
Northern Caucasus	C		14	1															
	D		10																

[illegible]	C																		
On vessel:																			
At La Plata, from Rosario, Argentina	C							1											
S. S Aghios Gerasimos, at Vigo, Spain	C				3														

Place		July-September	October	November	December	January	February
Algeria: Algiers	C		2				
British East Africa: Kenya	C	95	18	28	16	26	
Ecuador: Guayaquil	C	15	4	9	5	4	6
	D			3	2	4	8
Indo-China (French)	C	14	3	3	4	7	
Madagascar	C	314	166	209	317	427	
	D	286	155	159	261	388	
Ambositra Province	C	7	6	1	18	105	
	D	7	6	1	10	96	
Antisirabe Province	C	39	19	15	72	117	
	D	38	19	17	72	117	
Itasy Province	C	46	16	23	62	33	
	D	41	15	25	54	29	
Moramanga Province	C	12	24	46	25	19	
	D	12	20	41	22	19	
Madagascar—Continued.							
Tananarive Province	C	211	99	170	139	155	
	D	189	93	153	108	129	
Mauritius	C	1					
Nigeria	C	32	27	16	20	16	
	D	29	27	16	18	16	
Peru	C	34	14	6	14		
	D	19	5	2	4		
Callao	D	3			3		
Lima	C				7		
	D		1	1	1		
Syria: Beirut	C				2		

[1] During January, 1928, 5 cases of plague were reported in interior of Senegal.
[2] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases, D, deaths, P, present]

Place		July 31–Aug 27, 1927	Aug. 28–Sept 24, 1927	Sept 25–Oct 22, 1927	Oct. 23–Nov 19, 1927	Nov 20–Dec 17, 1927	Week ended— December, 1927: 24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	March, 1928: 3	10	17	24
Algeria	C	459	382	683	661	170	81	26	7	15	17	18	11							
Algiers	C					3	3	4		2	3	1	7	4	4			1		
Oran	C	9	16	11	20	39	8	15	2	4	2	2	4		1		2	2		
Arabia: Aden	C				1	3	1								1					
Brazil:																				
Para	C	1																		
Rio de Janeiro	C	6	10		1															
	D	4	9		1															
British East Africa: Tanganyiki	D	21	8	P	P	P			2	6	4		1							
British South Africa:																				
Northern Rhodesia	C	55	39	164	185	252	2	81	141	12	3		230		79					
	D	1	2	11	64	62		8	23				23		5					
Southern Rhodesia	C				3	2	1						P	3	2	4				
	D															1				
Canada:																				
Alberta	C	17	17	23	10	19		3	3	5	1	19	1	6		3		7		
Calgary	C	1																	1	
Edmonton	C			1	1	8				2	1			2	1		11	1	1	11
British Columbia: Vancouver	C		2			4	1	3	3	1	11	3	1	11	2	1	3	4	2	5
Manitoba	C	13	9	7	19	7	2	2	2	5		1								
Winnipeg	C	5	4	2	2	2	1			1	1	1								
New Brunswick	C		2				1									1				
Nova Scotia	C		1	1																
Halifax	C			1																
Ontario	C	60	22	96	264	347		53	83	76	52	77	63	51	40	51	36	20		
Hamilton	C					2													2	
Kingston	C				1		1							1						
Ottawa	C	27	40	67	134	63	18	9	10	23	20	16	23	9	11	3	1	7	6	8
Toronto	C		2	10	34	39	7		11	10	8	5	1	6	4	4	2	4	2	3
Windsor	C			9																
Quebec	C	1		8	25	16	14	3	10	17	7		11	8	11	13		18		
Montreal	C				1		1		1	6	3	4	1		5	1	3		6	3
Quebec	C					4		2		3		5				2	5	4	3	
Riviere du Loup	C				3															
Saskatchewan	C	14	68	31	34	58	12	13	15	12	39	15	9	34	7	8		7		
Moose Jaw	C	10	16	3		1		1	2	1	4	2	3	2		2	6	5	2	5

Regina	C	8		5	1	1														
Saskatoon	C					2		4			13	1		1		2				
Ceylon: Colombo	C	1			1	2					1		1	2	2	1	3			
	D	1				1					1									
China:																				
Antung	C									1										
Canton	C		1																	
	D		1																	
Chefoo	C		1	P		P														
	D		1														1			
Foochow	C	P	P	P	P	P	P	P		P		P		P						
Hong Kong	C	1	2							1	1		1		1	3		3		
	D	1	2						1			1	1			1	1	2		
Manchuria—																				
Changchun	C					1						4								
Dairen	C			1	2	1			2	3	1		5	9	3					
	D			1								1	2	5	4					
Fushun	C		1		1															
Harbin	C					2		1				2	1	2	2					
Mukden	C			2	1							1		3	18		3			
Pensihu	C			1																
Shanghai—																				
Foreigners only	C										1	2		2	1	1	1			
Including natives	D										3	2	3	3	5	4	4	6		
Tientsin	C		4	13	8	9	2			6	20	10	10	8	5					
Curacao (alastrim)	C										2				3					
Dutch East Indies																				
Borneo—																				
Samarinda district	C				P															
South and East Borneo Residency	C	P																		
Java—																				
Batavia and West Java	C	4		4	25								1	3						
	D				15															
East Java and Madura	C	4	22	8	9	9		3	1	1	2									
	D			1																
Sumatra: Medan	C					3		8		1	3	5	5	10	7	3				
	D					2		1		2	4	4		3						
Egypt	C		3			4		4								1				
	D		1	1		1														
Cairo	C					2														
Great Britain:																				
England and Wales	C	568	508	473	902	1,041	255	247	275	398	405	370	386	369	369	392	365	347	359	
Birmingham	C	1		1							14	17	11	2	1		2		1	
Bradford	C				11	10	2	2	4	24	6	9	7	2	7	1		4	9	
Bristol	C			6	4	8						2		1			1	3		
Cardiff	C				1				1											
Leeds	C	5	3	7	5	16	4	6	1		1			2	1	2	4	2		
Liverpool	C									1								1		
London	C										2		1	5	10	1	2	1	10	
Manchester	C			3	6	25		1	2	2	11	6	4	4	1	4	1	2	4	
Newcastle on Tyne	C	1	2	6	9	55	2	13	2	5	14	3	4	6	4	1	4	3	5	
Nottingham	C								7	6	4	8	6	9	6	1	3	1		
Sheffield	C	2	1	10	6	9	3		1	10	4		4		1	2	2	1		
Stoke on Trent	C	1							3	1			1		2	4	3	6	11	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended—December, 1927: 24	December, 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24
Greece: Saloniki	D	2																		
India	C	5,911	4,398	3,153	4,052	6,731	2,225	2,502	2,664	3,285	4,129	3,631								
	D	1,668	1,120	715	927	1,650	515	578	551	785	964	803								
Bassein	C	1												1						
	D	1																		
Bombay	C	33	12	10	4	9		4	4	6	10	23	10	18	29	23	46	51		
	D	19	8	2	3	2					2	8	7	7	15	13	23	22		
Calcutta	C	27	22	5	5	25		17	9	14	14	11	23	10	9	18	14	30		
	D	25		6	2	11		17	4	6	10	7	10	7	5	11	10	24		
Madras	C	6	7	8	7	11	2		11	8	9	16	20	29	15	33	21	31		
	D		2		2	3	1		4	1	3	2	2	1	3	3	3	10		
Nagapatam	C	3	1							5		4	2	2	1		1	1		
	D	2	1							3		2	1							
Rangoon	C	14	9	17	6	14	36	28	23	49	41	34	103	97	68	82	132	95		
	D	3	2	3	1	4	5	13	4	9	13	10	18	23	22	24	26	32		
Vizagapatam	C		3						3		2	1	5	2		1		1		
	D		2								6	1		1						
India (French):																				
Karikal	C	3	1	2	P															
	D	3	1	2																
Pondicherry	C	39	37	38	42	41	6	16	25	18	15	17	15				6	3		
	D	31	37	38	42	41	6	14	12	18	15	17	15				6	3		
Indo-China: Saigon	C	1	1			1		1	1	1								1		
Iraq:																				
Baghdad	C		1	7	5	25	9	9	3	2	7	6	3	3	2					
	D		1	4	4	14	7	3	2		3	5	2	1	1					
Basra	C	1	4	2	3	4		2			1						2	4		
	D	1	4	2	1	3		1												
Italy:																				
Leghorn	C																1			1
Rome and vicinity	C		1				2													
Jamaica (outside Kingston) (alastrim)	C	6	9	9	7	3		2				4	1		1	3				
Kingston	C		3	2																
Japan:																				
Nagasaki	C	2																		
	D	1																		
Tokyo	C										2	1		1		1				
	D											1								

Mexico:																				
Acapulco	C		2		1															
	D		2		1															
Chihuahua	D								1											
Guadalajara	D					2											1			
Manzanillo	D									1									1	
Mexico City and surrounding territory	C					4							1	1	2					
San Luis Potosi	D	1																		
Tampico	C															1				
Torreon	D	1		2																
Palestine: Jerusalem	C					1						1								
	D											1								
Poland	C	2				1	5	1			1	1	1							
	D	1																		
Porto Rico	C																		P	
Portugal:																				
Lisbon	C		3	8	4	10	1	2	4	5	5	2	2	3	3	9	4			
	D					1														
Oporto	C		1																	
Senegal: Dakar	C															8				
Siam	C	51	27	6	1	9	2	5	8	8	13	7	5	10	1	7				
	D	10	15			1			2		1	1	2		1	1				
Bangkok	C		3		1	1		1	2											
	D		1						1											
Spain:																				
Malaga	D				1	1														
Seville	C									1										
Valencia	C			1				1	1									1		
Straits Settlements: Singapore	C				1									1						
Switzerland	C						2													
Tunisia: Tunis	C							2	2			3			2	4				
Union of South Africa:																				
Cape Province	C	P		P							P									
Orange Free State	C	P			P	P	P				P									
Transvaal	C			P	7															
Venezuela: Maracaibo	D		2	1										1				1		

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928		
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Algeria	C	376	459	382	682												
Oran	C	14	10	16	11												
Indo-China (French)	C	19	3	21	25	13	3	22	10	4	20		40	18	50	31	90
Syria:																	
Aleppo	C										1		1				
Beirut	C								1		1			15	11	26	
Damascus	C		3	5	22		13		4	6	2	11	2				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths, P, present]

Place		July-September	October	November	December	January	February
Angola	C	51	73	71			
	D		2				
Congo	C	5	77				
Cuanza-Norte	C	1					
Cuanza-Sul	C		2				
Loanda	C	1					
Zaire	C	3	4	1			
Brazil: Porto Alegre	C	11	4	1			
British East Africa: Zanzibar	C		2				
	D		1				
Chosen	C	21	2	2			
	D	6		1			
Ecuador: Guayaquil	C	4	1	1	4	2	9
France	C	37	7	4	14	11	
Gold Coast	C	7	4				

Place		July-September	October	November	December	January	February
Greece	C	10	4		5	6	11
	D						2
Latvia	C		2				
Mexico	D	221		157			
Morocco	C	180	81	140	401	55	
Nigeria	C	820	223	93			
	D	173	51	30			
Persia	D			2		7	
Spain Madrid	D			1			
U. S. S. R							
Railways etc	C	26	7	11			
Other territories in Europe	C	366	220				
Transcaucasus, Siberia, and Central Asia	C	80	40	21			
Ukraine	C	27	11	20			

TYPHUS FEVER

[C, indicates cases; D, indicates deaths; P, present]

Place		July 31-Aug. 27, 1927	Aug 28-Sept 24, 1927	Sept. 25-Oct. 22, 1927	Oct 23-Nov 19, 1927	Nov 20-Dec 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928		
							24	31	7	14	21	28	4	11	18	25	3	10	17
Algeria:																			
Algiers	C											1						1	
Oran	C						1	1	1	1		2			2	1	6		
Austria: Vienna	C												1						
Bulgaria: Sofia	C			17	6	1	1	4	1		1								
	D				1														

Chile:																			
Antofagasta	D			1															
Valparaiso	C		1		1	2				1									
	D	2	1		2														
China:																			
Manchuria—Harbin	C	2			1														
Tientsin	C		2																
Egypt	C	2		12	4	14	1		3	4	2			1				1	
	D	3		5		8			3	1									
Cairo	C					3													
	D					3													
Port Said	C			1		1													
Ireland (Irish Free State):																			
Cork County	C					3			1										
Donegal County, Letterkenny	C			4															
Mexico:																			
Guadalajara	D					1													
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	4	4	4	3	2	1		2	1		4	3	6
	D				2	1	1	3	1								3	1	
Morocco	C								107	235	257	214	370	210					
Palestine	C	11	1	5	3	9				8		2	2	1	1	2	6		
Poland	C	50	35	19	64	93	26	33	68	68	101	92	87	66	57				
	D	6	2	4	11	10	1	3	6	6	4	3	5	7	10				
Portugal: Oporto	C	1			1									1					
Rumania	C	36	16	17	22	35	32	17	19				15	24					
	D	1		2				2	1				2	7					
Syria: Aleppo	C		2						2										
Tunisia	C	14	1	3	1	1	1			5	4				1				
Union of South Africa.																			
Cape Province	C	P	P	P	P	P	P	1	P		P	P	1	P					
Natal	C	P	P	P	P	2	2	P	P	1		P		1					
Orange Free State	C			P		P							P	P					
Transvaal	C	1		5	P	P													

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases, D, deaths, P, present]

Place		1927				November, 1927			December, 1927			January, 1928			Feb. 1-10, 1928
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	
Algeria	C	67	33	10	12										
	D	13			1										
Algiers	C	2	2	6	2										
Bulgaria	C	12	24	7	2						2	7	6		8
	D		1	2	1						1		1		1
Morocco	C	148	76	7	11	5	14	7	5	6	75				

Place		July-September	October	November	December	January	February
Argentina: Rosario	C			1			
	D				1	1	
China Shanghai	D			1			
Chosen	C	90	16	26	38		
	D	8	1	2	3		
Chemulpo	C	3				1	
Gensan	C	2				1	
	D					1	
Seoul	C	5	2				
	D	1	1				
Czechoslovakia	C	12	1		6		
Greece: Athens	C	3			1	2	2
Japan	C	1		1			
Latvia	C	6					

Place		July-September	October	November	December	January	February
Lithuania	C	69	9	18	27	86	
	D	14	1	1	1	10	
Mexico	D	64	36	29			
Peru							
Arequipa	D	3	2		1	2	
Lima	D	8					
U. S. S. R.							
Railways, etc	C	77	23	33			
Transcaucasus, Siberia, and Central Asia	C	208	61	49			
Ukraine	C	295	151	198			
Other territories in Europe	C	1,839	521				
Yugoslavia	C	20	1	1		7	
	D	5				3	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Co[illegible]nued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927 5	November, 1927 12	November, 1927 19	November, 1927 26	December, 1927 3	December, 1927 10	December, 1927 17	December, 1927 24	December, 1927 31	January, 1928 7	January, 1928 14	January, 1928 21	January, 1928 28	February, 1928 4	February, 1928 11	February, 1928 18	February, 1928 25
Ashanti: Obuasi	C		1																				
	D		1																				
Belgian Congo:																							
Boma	C														3								
	D														2								
Matadi	C														0	12	11	1	5	8			1
	D														2	6	8	2	5	6			
Dahomey:																							
Grand Popo	C									1													
	D									1													
Porto Novo	C	1																					
	D	1																					
Ivory Coast	C	1											1										
	D	1											1										
Liberia: Monrovia	C			1																			
Nigeria	C			2																			
	D			2																			
Senegal	C	3	10	21	31	9	16	6	6	7													
	D	3	9	21	31	8	10	4	4	6													
Dakar	C	1			12	3	6		5	2	1	4		1	1								
	D				7	2	4		4	2	1	4		1	1								
Togoland	C		1																				
	D		1																				

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

X

TREASURY DEPARTMENT

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ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 43 :: :: NUMBER 16

APRIL 20 - - - 1928

SPECIAL ARTICLES

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

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ASST SURG GEN R C. WILLIAMS, *Chief of Division*

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CONTENTS

PUBLIC HEALTH REPORTS

VOL. 43 APRIL 20, 1928 NO. 16

THE ACTION OF CURRENTS OF VERY HIGH FREQUENCY UPON TISSUE CELLS

A. UPON A TRANSPLANTABLE MOUSE SARCOMA.

By J. W. SCHERESCHEWSKY, *Surgeon, United States Public Health Service, Associate in Preventive Medicine and Hygiene, Harvard Medical School*

INTRODUCTION

In a previous paper [1] were reported some of the effects of an electrostatic field, forming part of a tuned circuit excited by electrical oscillations of very high frequency (135,000,000 to 8,300,000 cycles per second), upon small laboratory animals (mice). The oscillations were generated by a three-element tube oscillator of special design.

It was observed in the course of these studies that these currents, applied through the action of the field just mentioned, were capable of injuring tissues, and, moreover, that their action bore some relation to the frequency employed, oscillations of the highest and lowest frequencies studied having much less effect than those of intermediate frequencies.

Since frequency seemed an important factor in the action of these oscillations, the thought occurred that, under suitable conditions, oscillations at certain frequencies might prove more injurious to some tissue cells than to others; in other words, there might be a differential action upon tissue cells with respect to frequency

Evidently the tissue cells of transplantable tumors should be excellent experimental objects for this purpose. Here we have groups of cells distinguished from the adjacent tissue cells by their size and their active proliferation, not only contributing nothing to vital functions, but being highly detrimental to their host. Retardation of their growth or their eventual recession through the action, under suitable conditions both as to frequency and method of application, of electromagnetic radiation might well develop interesting data with respect to such possible differential action.

[1] Schereschewsky, J. W. The Physiological Effects of Currents of Very High Frequency (135,000,000 to 8,300,000 Cycles per Second) Pub Health Repts, vol 41, No 37 (Sept 10, 1926), pp 1939-1963

This paper is a preliminary report on this phase of the subject and describes attempts which have met with a certain amount of success to influence adversely the growth of a transplantable mouse sarcoma of great virulence, and also, with H. B. Andervont as collaborator, that of the well-known Rous fowl sarcoma.

The mouse tumor selected for these experiments was the strain of mouse sarcoma known as the Crocker Research Laboratory's No. 180, which was kindly furnished to the writer by Dr. F. C. Wood, director of the Crocker Laboratory for Cancer Research, for which grateful acknowledgment is hereby made.

Grateful acknowledgment is also made to Dr. M. J. Rosenau, professor of preventive medicine and hygiene of the Harvard Medical School, for permitting the use of the laboratory facilities in his department for these studies, and to Asst. Prof. Lloyd D. Felton for bacteriological work in connection with the tumors used.

This mouse sarcoma is reputed to be one of the most virulent of the known strains of laboratory tumor. Implantations yield 95 to 96 per cent of takes, and spontaneous recessions seldom occur. From information obtained on a visit to the Crocker Laboratory, in 10,000 implantations of the tumor 96 per cent were successful, while spontaneous recessions were observed in but 2 per cent of the instances.

Though the tumor is now in its twenty-third generation since it was received by the writer, no case of spontaneous recession has been observed in at least 230 control mice, the tumor causing the death of the animals in from four to six weeks from the date of implantation.

APPARATUS AND METHODS

In subjecting the tumors to the action of the very high-frequency currents, the following apparatus and methods were employed:

Generation of high-frequency currents.—For generating currents of very high frequency use was made of a three-element tube oscillator having a range of 150,000,000 to 60,000,000 cycles per second. The circuit used is one described by Huxford [2] and is excellently adapted to the efficient and stable generation of oscillations in this range of frequencies. The oscillator used in these experiments is fully described and illustrated as oscillator No. 2 in the writer's paper to which reference has already been given.

For the convenience of the reader Figure 1 shows the circuit network and Plate 1 the general appearance of the oscillator with the accompanying auxiliary circuit for applying the high-frequency currents to the tissues to be treated.

Determination of frequency.—For determining the frequency at which the oscillator was operating, the Lecher parallel wire system

[2] Huxford, W. S: Standing Waves on Parallel Wires Physical Review, Corning, N. Y., 2d series, vol. 25 (1925), pp 686–695.

described in my previous paper (to which the reader is referred) was employed. This system permits the determination of the wave length, and hence the frequency, with an accuracy of perhaps one-half of 1 per cent or less.

Utilization of oscillator output.—In studying the effects of currents of very high frequency on the growth of tumors it is obviously inexpedient to make use of any conductive arrangement, as the

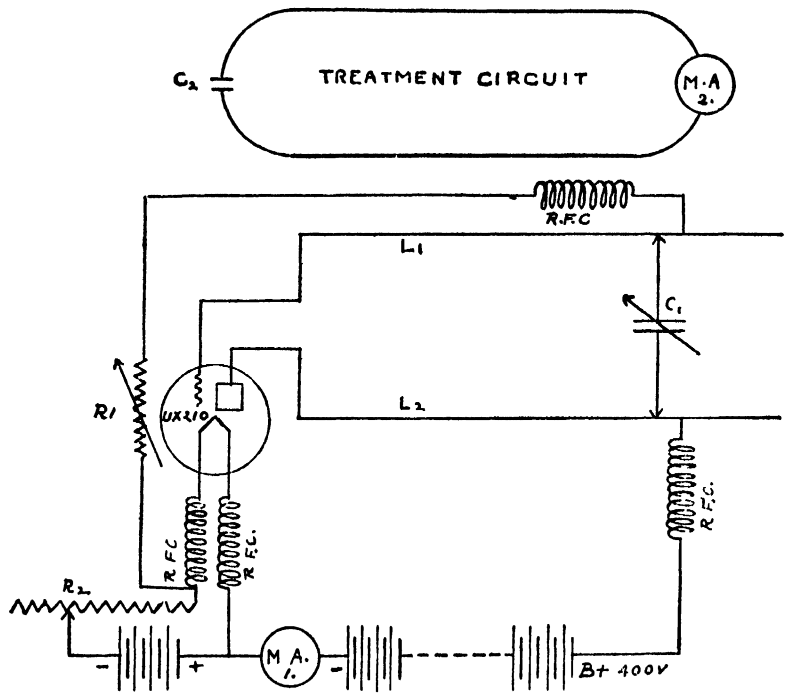


FIG 1 —Circuit diagram of high frequency oscillator (range 15,000,000 to 60,000,000 cycles)
L_1 = Grid inductance
L_2 = Plate inductance
C_1 = Tuning condenser
C_2 = Treatment electrodes
R_1 = Grid-biasing resistance (10,000 to 200,000 ohms)
R_2 = Filament rheostat
R F C. = Radio-frequency choke coils

constants of the oscillating system would, at these very high frequencies, be thereby seriously disturbed.

Therefore, the effect of these high-frequency oscillations on tumor cells was studied by means of an auxiliary tuned circuit which was inductively coupled to the oscillator. As shown by the accompanying diagram (Figure 2, and Plate I, A), this circuit consisted of an inductance and a capacity, the inductance consisting of a single-turn wire loop, having a Weston thermomilliammeter inserted at its mid-point to read the current, and the capacity of a pair of treatment electrodes,

presently to be described, which were connected through flexible leads and suitable binding posts to the inductance.

Treatment electrodes.—As in the experiments reported in the previous paper, it was the effect upon the growth of tumors of an intense electrostatic field which was investigated in the present studies. The tumors were subjected to the action of such field by including them between pairs of insulated copper plates which, through their connection by means of flexible leads, formed part of the auxiliary tuned circuit previously mentioned which was coupled inductively to the oscillator

These electrodes, of several convenient sizes (19 by 15 millimeters, 15 by 14 millimeters, and 12 by 12 millimeters) were cut out of 30-gauge copper sheet, the corners being slightly rounded. They were also bent on a slight arc of a circle, so that when applied to either side of a tumor they would tend to lift the tumor mass away from the underlying tissues, thus concentrating the influence of the electro-

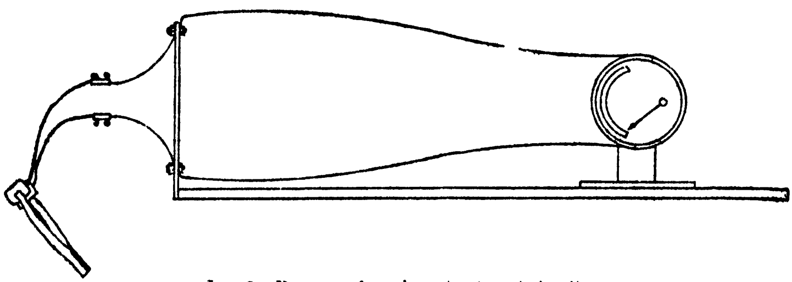
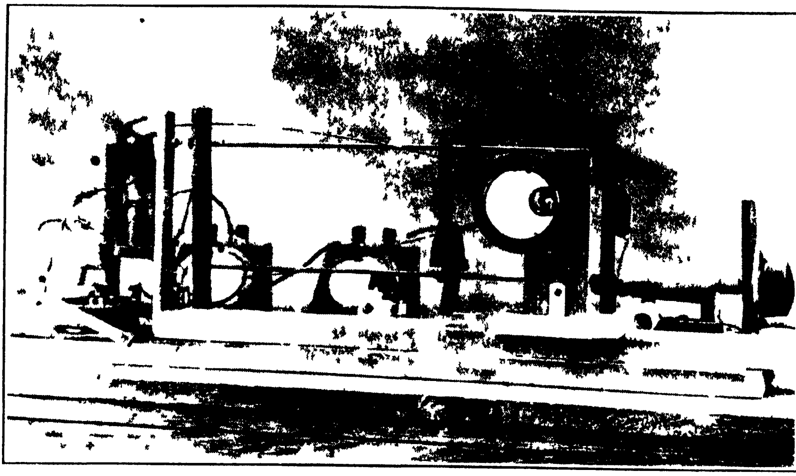


FIG 2.—Diagram of auxiliary treatment circuit

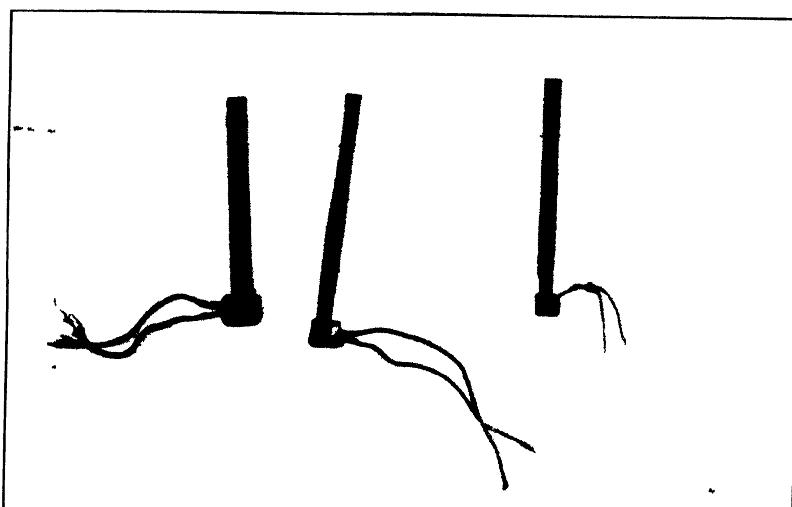
static field between the plates upon the tumor, while at the same time diminishing it upon the adjacent tissues.

In order properly to apply the treatment electrodes to the tumors, the electrodes were mounted by means of cellulose lacquer to a tissue forcepslike arrangement, made of two strips of stout celluloid about 11.5 centimeters long, 0 8 centimeters wide, and 1.5 millimeters thick. These strips were glued together at the end opposite the plates by a dab of the lacquer, and the remainder of the strips was given a suitable curve by bending them while heated. The appearance of the treatment electrodes is shown in the photograph. (Pl. I, B.)

Insulation of electrodes—Since the studies were concerned with the effects of an electrostatic field, and since the electrodes with the intervening tissues formed the capacity which, taken in conjunction with the inductance formed by their flexible leads and the rest of the wire in the auxiliary coupled circuit, caused this circuit to be tuned to the frequency generated by the oscillator, it was deemed necessary to avoid all metallic conduction effects upon the tissues subjected to treatment by carefully insulating the surfaces of the treatment electrodes.



A H[illegible]h frequency os[illegible]llator (r[illegible] e 150 000 000 t 60 000 000 [illegible]) w[illegible] [illegible] illiary treatment circuit placed [illegible]



B Treatme[illegible]t [illegible]lectro[illegible]e of var[illegible]o[illegible] [illegible]ze

As the studies proceeded the impression was strengthened that the nature and quality of the insulation covering the electrodes played an important part in the results, defective or broken-down insulation resulting in undesirable effects, such as little or no current in the auxiliary circuit, pain, sparking, local heating, burning of tissues, and the like.

After some experimenting the following insulating lacquer was found to be satisfactory:

Cellulose acetate (Eastman Kodak Co.'s No. 1097)	grams	11
Acetone, Merck's C P	cubic centimeters	100

In the preparation of this lacquer, care should be taken to avoid the presence of moisture. Before mixing, the cellulose acetate was dried by keeping it in the incubator room (which was very dry) for several days, or in a desiccator. The use of Merck's C. P. acetone was also found desirable, as the commercial variety appears to contain a small amount of moisture, resulting in milkiness of the lacquer

Before applying the lacquer, the surface of the electrodes was burnished with fine steel wool and then freed from grease by dipping in ether. This is necessary in order to secure good adhesion Each electrode was given three coats of the lacquer by dipping and allowing the surplus to drain off, each coat being first allowed to dry thoroughly. When properly applied, the insulating lacquer is glassy and transparent Air bubbles are to be avoided, as they form weak points in the insulation which are prone to break down

The insulation appears to deteriorate with use so it was scraped off and the electrodes were recoated whenever the clear glasslike appearance was lost or the insulation became loosened along the edges

Tuning of auxiliary treatment circuit —In order that any considerable oscillating current should flow through the auxiliary circuit when placed in inductive relation to the oscillator, from well-known physical considerations it is, of course, necessary that the auxiliary circuit should be approximately in resonance with the frequency at which the oscillator is operating This is readily accomplished by a "cut and try" method by varying the length of the wire forming the inductance of the auxiliary circuit until the current indicated by the thermomilliammeter inserted in the auxiliary circuit is a maximum for a given oscillator output and degree of coupling

Since practically all the studies were carried out at uniform frequencies of 68,000,000 to 66,000,000 cycles per second, once the length of the wires had been satisfactorily determined, it was not necessary to change the adjustment throughout the experiments. In this particular instance it was found that a total length of wire of 52 centimeters (including the flexible lead to the electrode) from each binding post of the meter, with a maximum spacing of 15 centimeters,

taken in conjunction with the capacity furnished by the plates of the treatment electrode, formed a circuit roughly in resonance with the frequencies mentioned above.

Using a UX 210 tube having a rating of 7.5 watts with a plate voltage of 400 and a filament current of 1.25 amperes, currents of over 500 milliamperes were readily obtainable in the auxiliary circuit. Using a more powerful tube especially adapted to short-wave transmission, such as the UX 852, with suitable plate voltage, no doubt currents of 5 or more amperes could as readily be obtained. Since the currents applied in these experiments scarcely ever exceeded 350 milliamperes, the output obtained with the UX 210 proved entirely satisfactory.

Frequencies employed.—As mentioned before, with but few exceptions, this series of experiments was conducted at frequencies, rather arbitrarily chosen, of between 68,000,000 and 66,000,000 cycles per second. In the writer's previous paper mention is made of an interesting hypothesis suggested by Prof. G. W. Pierce, of Harvard University, director of the Cruft High Tension Laboratory, that tissue cells placed in an electrostatic field and subjected to the displacement currents caused by the rapid alternations in polarity of the field may undergo some mode of electromechanical vibration which might well have definite effects upon the cell. Professor Pierce also supplied the writer with a simplified formula based on Lamb's[3] mathematical investigation of mechanical oscillations in solid elastic spheres by which the diameter of the smallest sphere capable of vibrating in some mode at a particular frequency may readily be calculated, if we assume that sound vibrations travel through tissue cells with approximately the same speed as through water.[4] Now the diameter of the tumor cells of the mouse sarcoma used in these studies varies from 12 to 15 microns. According to the formula, solid elastic spheres of such diameters should be capable of mechanical vibrations at frequencies ranging from 80,000,000 to 64,000,000 cycles per second. Lacking the means of orientation, frequencies within this range were therefore taken as a point of departure, and since these frequencies were found capable of exerting pronounced effects upon the cells of the tumor in question, experiments were continued at these frequencies until it was believed that sufficient data had been collected to justify their publication in a preliminary way.

Method of treating tumor-bearing mice.—For the sake of convenience in handling, tumors were uniformly implanted on the right anterior surface of the belly at a locality which, in human beings, would cor-

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[3] Lamb, H.: On the Vibrations of an Elastic Sphere. Proc. London Math. Soc., Series 1, 1882, vol. 13, p. 189.

[4] For a more extended treatment of this hypothesis the reader is referred to the writer's original paper.

respond to McBurney's point. Tumors in this situation were found to grow with great rapidity, often reaching a diameter of from 4–6 millimeters in 3 days and 10–12 millimeters in 6 or 7 days.

To subject the tumor to the action of the high-frequency currents, the mouse was held in the left hand by pinching a fold of skin on the back of the neck between the thumb and forefinger while at the same time holding the tail by pressure of the middle and ring fingers against the ball of the thumb. The oscillator having been turned on and the auxiliary circuit placed in its proper inductive relation to the oscillator, the tumor was gently pinched between the insulated plates of the treatment electrodes, the current indicated by the meter in the auxiliary circuit being kept constant at the selected value by varying the filament rheostat as required.

Controls.—Ten mice out of every lot of implantations were set aside as controls, so that the course of the tumor treated could be compared with that in control mice. The dates of death of the controls were recorded as they occurred. No case of spontaneous recession of a tumor was seen in any of the controls, some 230 in number.

Effects upon the growth of tumors.—Soon after the beginning of the experiments the fact was noted that treatment in the manner described had a pronounced immediate effect upon the tumor. The mass seemed to become much smaller and softer, and a small tumor 4 or 5 millimeters in diameter, might, just after treatment, barely be palpable There was usually some local reaction within 24 hours in the shape of edema of the treated area. In favorable cases, after the edema had subsided, the remains of the tumor were represented by a mass, which grew smaller and smaller until it eventually disappeared. There was usually, too, some superficial necrosis of the skin overlying the tumor, resulting in the shedding of the hair and the formation of a small eschar which came away in 10 days to 2 weeks, leaving the skin pink and healthy beneath it. The extent to which the overlying skin was affected appears very largely to be determined by the strength of the current used and the number of treatments required to cause recession of the tumor. In cases where one treatment was sufficient and the current was kept at a relatively low value (300 milliamperes or less), the skin disturbance was slight. In all cases, however, there seemed to be some shedding of the hair, so that the treated area could be detected two or three months after the absorption of the tumor.

When properly applied—i. e., with well-insulated electrodes and current not too high—the treatment appears to cause no pain. The mice remain passive, or struggling is no greater than is observed in mice forcibly restrained for similar periods of time. If, however, the insulation has become defective, or breaks down, pain is apparently

great, as shown by squealing and struggling of the mouse. Defects in the insulation may cause severe local heating of the tissues, followed by necrosis in them, a result to be avoided by careful attention to the state of the insulation on the electrodes before their application.

Recovery naturally depends on the death of the tumor cells. This tumor appears to have such vitality that the impression was gained that if but a few viable cells were left behind, recrudescence of the tumor was bound to occur. The presence of renewed activity on the part of the tumor was, as a rule, readily detected by the increase in size and a firm elasticity in the feel, characteristic of rapidly multiplying tumor cells. Almost without exception recrudescence of the tumor, if it occurred, was manifest within a short time after treatment, as a rule within 10 days. Among the mice listed as recovered no case of recrudescence or recurrence of the tumor was observed taking place after the death of the last control mouse. For this reason, if mice survived the last control mouse tumor free and in good health, they could be regarded as recovered for practical purposes.

In Table 1 are summarized the following data in regard to 100 mice in which, as a result of treatment, the tumor receded completely and the mouse was tumor free and in good health at the date of death of the last control: Laboratory number of mouse; date of inoculation; date of first treatment; size of the tumor, in millimeters; number of treatments; frequency employed; current used, measured in milliamperes; date on which recession of the tumor was complete and the skin had returned to normal condition; date of death of the last control mouse; remarks.

TABLE 1.—*Summarized data with regard to 100 mice which, as a result of treatment, were tumor-free at date of death of last control*

Mouse laboratory No.	Date inoculated	Date of first treatment	Size of tumor in millimeters	Number of treatments	Total duration of treatment	Frequency in megacycles	Current, in milliamperes	Date of complete recession of tumor	Date of death of last control	Remarks
					Min. sec.					
12	Sept. 26, 1927	Oct. 5, 1927	10 by 8	3	8 30	68–66	330	Oct. 29, 1927	Oct. 30, 1927	Tumor-free and in good health, Mar. 10, 1927.
13	do	do	11 by 10	3	9	68–66	300	do	do	Do.
14	do	do	9 by 8	5	14	68–66	330–300	Nov. 2, 1927	do	Do.
17	do	do	10 by 10	5	14	68–66	300	Nov. 7, 1927	do	Died Dec. 21, 1927, from intestinal infection. No trace of tumor at autopsy.
70	Oct. 21, 1927	Oct. 27, 1927	6 by 5	3	9	68–66	330–300	Nov. 22, 1927	Dec. 1, 1927	Good health till Jan. 15, 1928, when killed in fight with companion. No trace of tumor at autopsy.
71	do	do	12 by 9	2	5	68–66	380–350	Nov. 10, 1927	do	Do.
72	do	do	7 by 7	1	3	68–66	330	Nov. 11, 1927	do	Good health till Jan. 18, 1927, when died of wounds received in fight. No trace of tumor at autopsy.
88	do	do	9 by 6	2	4	68–66	350–300	do	do	Good health till Mar. 2, 1928, when died from intestinal infection. No trace of tumor at autopsy.
89	do	do	2 tumors each, 9 by 6.	3	8 30	68–66	330–300	Nov. 15, 1927	do	Good health till Feb. 22, 1928, when died of diarrhea. No trace of tumor at autopsy.
95	Oct. 26, 1927	Oct. 31, 1927	10 by 7	2	5 30	68–66	400–300	Nov. 22, 1927	Dec. 7, 1927	Tumor-free and in good health Mar. 10, 1927.
127	Nov. 7, 1927	Nov. 14, 1927	10 by 9	1	3	68–66	330	Nov. 29, 1927	Jan. 5, 1928	Do.
128	do	do	10 by 8	4	9 30	68–66	300–200	Jan. 6, 1928	do	Do.
129	do	do	9 by 9	1	2	68–66	300	Dec. 1, 1927	do	Do.
130	do	do	10 by 10	1	3	68–66	300	Nov. 28, 1927	do	Do.
133	do	do	12 by 10	1	3	68–66	300	Dec. 28, 1927	do	Killed in fight with companion Jan. 21, 1928. No trace of tumor at autopsy.
137	do	do	do	1	3 30	68–66	300	Nov. 29, 1927	do	Tumor-free and in good health Mar. 10, 1928.
138	do	do	9 by 9	3	7	68–66	300	Dec. 7, 1927	do	Do.
142	do	do	12 by 10	2	5	68–66	300–250	Dec. 27, 1927	do	Do.
143	do	do	13 by 9	3	6 30	68–66	300	Nov. 29, 1927	do	Do.
144	do	do	13 by 8	1	3	68–66	320–300	Nov. 26, 1927	do	Do.
145	do	Nov. 23, 1927	14 by 11	1	4	68–66	200	Dec. 7, 1927	do	Do.
146	do	Nov. 14, 1927	11 by 9	1	3 30	68–66	330	Dec. 1, 1927	do	Killed in fight with companion Feb. 22, 1928. No trace of tumor at autopsy.
191	Dec. 22, 1927	Dec. 30, 1927	10 by 8	3	9 30	68–66	300	Jan. 24, 1928	Feb. 5, 1928	Tumor-free, in good health, Mar. 10, 1928.
192	do	do	11 by 8	4	10 10	68–66	300–250	Jan. 30, 1928	do	Do.
199	do	do	2 tumors, 9 by 7 and 10 by 10.	4	11 30	68–66	300–250	Jan. 27, 1928	do	Do.
200	do	do	10 by 9	2	6	68–66	300	Jan. 16, 1928	do	Do.
205	do	Jan. 3, 1928	14 by 10	4	11 30	68–66	300–250	Jan. 24, 1928	do	Do.
206	do	do	2 tumors, each 10 by 10.	6	18	68–66	300–250	Feb. 2, 1928	do	Do.
207	do	do	12 by 10	5	15	68–66	300	Jan. 27, 1928	do	Do.
208	do	do	10 by 8	3	9	68–66	300–250	Feb. 8, 1928	do	Do.
209	do	do	14 by 10	5	16	68–66	300–250	Jan. 30, 1928	do	Do.

TABLE 1.—*Summarized data with regard to 100 mice which, as a result of treatment, were tumor-free at date of death of last control*—Continued

Mouse laboratory No.	Date inoculated	Date of first treatment	Size of tumor in millimeters	Number of treatments	Total duration of treatment (Min sec.)	Frequency in megacycles	Current, in milliamperes	Date of complete recession of tumor	Date of death of last control	Remarks
210	Dec. 22, 1927	Dec. 30, 1927	14 by 9	8	21	68–66	300–250	Jan. 30, 1927	Feb. 5, 1928	Tumor-free, in good health, Mar. 10, 1928.
214½	do	Dec. 28, 1927	9 by 8	5	11 45	68–66	300–250	Jan. 24, 1928	do	Do.
223	Dec. 28, 1927	Jan. 15, 1928	2 tumors, 6 by 6 and 9 by 9.	3	8	68–66	300	Jan. 27, 1928	(1)	Do.
238	Jan. 6, 1928	Jan. 16, 1928	2 tumors, 10 by 6, and 5 by 5.	2	5	68–66	250	Feb 2, 1928	Feb. 21, 1928	Do.
239	do	Jan. 10, 1928	2 tumors, each 4 by 4.	2	5	68–66	250	Jan. 24, 1928	do	Do.
240	do	do	4 by 4	3	8 15	68–66	280–250	Feb 6, 1928	do	Do.
241	do	do	do	3	8 30	68–66	300–250	Jan. 27, 1928	do	Do.
242	do	do	3 by 3	3	8	68–66	300–250	Jan. 30, 1928	do	Do.
243	do	Jan. 16, 1928	2 tumors, 10 by 8 and 5 by 5.	2	5	68–66	300–250	Feb. 6, 1928	do	Do.
244	do	do	2 tumors, 4 by 4 and 5 by 5.	2	5	68–66	300–250	Jan. 27, 1928	do	Do.
245	do	Jan. 10, 1928	4 by 4	2	6	68–66	300–250	Feb. 2, 1928	do	Do.
252	do	Jan. 11, 1928	do	3	8 30	68–66	280–250	Feb. 6, 1928	do	Do.
261	do	Jan. 13, 1928	2 tumors, 8 by 8 and 5 by 5.	2	6	68–66	300–250	Feb. 8, 1928	do	Do.
262	do	do	6 by 6	2	5 30	68–66	300–250	Feb. 2, 1928	do	Do.
263	do	do	2 tumors, 5 by 5 and 6 by 6.	3	8 30	68–66	300–250	Jan. 27, 1928	do	Do.
264	do	do	5 by 6	1	3	68–66	290	Feb. 2, 1928	do	Do.
265	do	do	8 by 8	2	6	68–66	300–250	Jan. 30, 1928	do	Do.
266	do	do	do	2	5	68–66	300–250	Jan. 24, 1928	do	Do.
272	do	Jan. 17, 1928	10 by 10	2	6	68–66	300–200	Jan 26, 1928	do	Do.
275	Jan. 14, 1928	Jan. 21, 1928	2 tumors, each 4 by 4.	4	12	68–66	300	Jan. 30, 1928	do	Do.
276	do	Jan. 19, 1928	5 by 10	2	5	68–66	300	Feb. 2, 1928	do	Do.
277	do	do	2 tumors, 5 by 5 and 6 by 6.	3	9	68–66	300–280	Feb. 6, 1928	do	Do.
278	do	do	4 by 4	1	3	68–66	300	do	do	Do.
279	do	do	5 by 5	1	3	68–66	300	Jan. 30, 1928	do	Do.
280	do	do	do	2	6	68–66	300–250	Feb. 2, 1928	do	Do.
313	Jan. 18, 1928	Jan. 23, 1928	2 tumors, 5 by 5 and 4 by 4.	2	6	68–66	300–250	Feb. 11, 1928	do	Do.
314	do	do	5 by 5	1	3	68–66	300–250	Feb. 13, 1928	do	Do.
322	do	do	2 tumors, each 5 by 5.	2	6	68–66	300	Feb. 8, 1928	do	Do.

323	do	do	11 by 8	2	6		68–66	300–250	Feb. 10, 1928	do	Do.
343	Jan. 25, 1928	Jan. 28, 1928	5 by 5	2	6		68–66	300–250	do	Mar. 6, 1928	Do.
344	do	do	6 by 6	3	9		68–66	300–250	Mar. 7, 1928	do	Do.
345	do	do	4 by 4	2	3		68–66	300–280	Feb. 17, 1928	do	Do.
346	do	do	2 tumors, 7 by 7 and 5 by 5.	3	8	30	68–66	300–250	do	do	Do.
347	do	do	2 tumors, 5 by 5 and 3 by 3.	3	9		68–66	300–250	do	do	Do.
348	do	do	7 by 7	2	6		68–66	300–250	Feb. 10, 1928	do	Do.
349	do	do	6 by 6	2	6		68–66	300–250	Feb. 15, 1928	do	Do.
350	do	Jan. 31, 1928	10 by 5	3	7		68–66	300–250	Mar. 7, 1928	do	Do.
351	do	do	10 by 10	2	6		68–66	300–250	Feb. 15, 1928	do	Do.
353	do	do	2 tumors, each 7 by 7.	2	6		68–66	290	Feb. 25, 1928	do	Do.
354	do	do	6 by 6	1	3		68–66	250	Feb. 17, 1928	do	Do.
355	do	do	5 by 5	1	3		68–66	300–250	Feb. 8, 1928	do	Do.
357	do	Jan. 28, 1928	6 by 6	2	6		68–66	300–250	Feb. 17, 1928	do	Do.
358	do	do	9 by 8	2	6		18–66	300–250	Feb. 13, 1928	do	Do.
359	do	do	6 by 6	3	8	30	68–66	300–250	do	do	Do.
360	do	do	5 by 5	5	13	45	68–66	300–250	Feb. 25, 1928	do	Do.
361	do	do	10 by 6	1	3		68–66	300–250	Feb. 13, 1928	do	Do.
362	do	do	2 tumors,[2] 6 by 6 and 11 by 11.	5	16		63–66	300–250	Mar. 7, 1928	do	Do.
363	do	do	5 by 5	3	9		68–66	300–250	Feb. 17, 1928	do	Do.
364	do	do	do	2	5	30	68–66	300–250	Feb. 15, 1928	do	Do.
366	do	Jan. 31, 1928	7 by 6	1	3		68–66	300–250	Feb. 13, 1928	do	Do.
367	do	do	6 by 6	1	3		68–66	300–250	Feb. 10, 1928	do	Do.
368	do	do	do	1	3		68–66	300	Feb. 13, 1928	do	Do.
369	do	do	8 by 8	2	5	30	68–56	300–250	do	do	Do.
370	do	do	10 by 6	1	3		68–66	300	Feb. 25, 1928	do	Do.
371	do	do	2 tumors, 6 by 6 and 5 by 5.	[2] 2	6		68–66	300–250	Feb. 13, 1928	do	Do.
372	do	do	7 by 7	2	6		68–66	300–250	Feb. 25, 1928	do	Do.
380	Feb. 1, 1928	Feb. 7, 1928	2 tumors, 6 by 6 and 5 by 5.	[2] 2	6		68–66	300	Feb. 21, 1928	Mar. 5, 1928	Do.
381	do	do	7 by 7	2	6		68–66	300–250	Feb. 27, 1928	do	Do.
382	do	do	6 by 5	1	3		68–66	300	Feb. 20, 1928	do	Do.
383	do	do	2 tumors, 7 by 7 and 4 by 4.	[3] 2	6		68–66	300–260	Feb. 18, 1928	do	Do.
384	do	do	7 by 7	2	6		58–66	300–250	Mar. 21, 1928	do	Do.
385	do	do	9 by 7	2	6	45	68–66	300–250	Mar. 6, 1928	do	Do.
386	do	do	7 by 6	1	3		68–66	300–280	Feb. 27, 1928	do	Do.
388	do	do	2 tumors, 8 by 8 and 6 by 6.	2	6		68–66	250	Feb. 23, 1928	do	Do.
389	do	do	15 by 8	2	6		68–66	290	Feb. 18, 1928	do	Do.
391	do	do	9 by 6	1	3		68–66	300–250	Feb. 21, 1928	do	Do.
392	do	do	2 tumors, 4 by 4 and 5 by 5.	[3] 2	6		68–66	290	Feb. 23, 1928	do	Do.
394	do	do	7 by 6	2	5	30	68–66	300–290	Feb. 21, 1928	do	Do.
403	do	do	9 by 9	2	6		68–66	300–250	Mar. 8, 1928	do	Do.

[1] Record lost.

[2] Secondary tumor developing later.

[3] 1 to each.

DISCUSSION

The table sets forth the principal data with respect to 100 mice, formerly bearers of the mouse sarcoma worked with, which survived their controls tumor-free and apparently in good health.

These mice were the survivors of 403 mice which were treated and observed. Consequently the percentage of recovery was practically 25 per cent, the remaining 303 mice dying from various causes before the death of the last control mice. Certainly, these results fall far short of the ideal of 100 per cent of recoveries. However, these figures include all the mice experimented with from the very beginning, except those under treatment at the time of the present writing. As will be seen by the large gaps in the sequence of numbers of the recovered mice, results were very poor at first, but improved later on. Attention is invited to the series commencing with mouse No. 343 and ending with mouse No. 372. The only mice dying in this series were mice Nos. 352, 356, and 365, which died from some intercurrent affection after the tumor had receded. This gives 27 survivors out of a series of 30 mice, or 90 per cent of recoveries

One feature worth noting is the fact that of the 403 mice treated, only 22, or about 5.5 per cent, actually died of tumor, the remainder dying from other causes.

One circumstance which led to considerable unavoidable mortality among the mice is the association of this tumor, as is often the case, with a diphtheroid bacillus, which of itself is pathogenic for mice. This organism, a Gram positive pleomorphic diplococcus, was frequently encountered in the heart blood of mice which, after making good progress toward recovery from the tumor, began to sicken and lose weight, eventually dying in three weeks or so after treatment had been started, often after the tumor had apparently receded completely.

Asst Prof. L. D. Felton kindly isolated this organism for me from a tumor and showed not only that it might be very pathogenic for mice, but also that it had the property of causing local necrosis of tissue. Again, a number of mice were lost from intercurrent intestinal disorders so common in laboratories. Due to lack of any previous experience, the treatment, too, was responsible for the loss of a number of mice in that the dosage was too high or the treatments were unnecessarily repeated. In a delicate creature such as a mouse the treatment in itself is quite capable of causing death if the dosage is too high, and a number of mice were lost in this way, especially in the earlier days, the mice dying within 24 or 48 hours after the treatment was applied.

Even now, since histologica work has been begun on the mode of action of these high-frequency currents, the writer is of the belief

that the current values as set forth in the table are still too high, and had these been reduced to values in the neighborhood of 240 to 200 milliamperes, the results might have been materially better

Mode of action of the high-frequency currents.—At present not much positive information can be given as to the mode of action of these high-frequency currents upon the tumor cells, although histological studies, later to be reported, are now in progress which, it is hoped, will throw light on the question. The action of the electrostatic field in which the tumors are placed for treatment does not seem to be the same as that in medica diathermy with the conventional high-frequency apparatus. With low-current values (not in excess of 300 milliamperes) and the time of exposure not exceeding three or four minutes, there does not appear to be any significant heating of the tissues. If the tissues are felt immediately upon the end of treatment, the local rise in temperature of the parts is often not perceptible or is slight. Yet the diminution in size and the softening of the tumor affected immediately by the treatment is striking and often remarkable.

It is evident that a potent destructive influence is exerted upon the tumor cells which brings about their death in a large number of instances and, in favorable cases, results in the complete absorption of the cell remains.

From a preliminary study of sections made of the tumor removed immediately and 24 hours after exposure in situ for a space of three and one-half minutes at a frequency of 68,000,000 cycles per second and at current values of 300, 250, and 200 milliamperes, the impression was strong that the tumor cells, and especially their nuclei, bore the brunt of the attack, the surrounding areolar tissue being much less affected. Fragmentation of the nucleus, disappearance of cell outlines, and pyknotic nuclei of the tumor cells were some of the effects noted.

Some of these sections were kindly examined for the writer by Dr. S. B. Wolbach, professor of pathological anatomy at the Harvard Medical School. Doctor Wolbach's personal communication to the writer reads, in part, as follows:

> In general, the immediate effects of the agency you have applied to the tumor is necrosis to the tumor cells and accompanying vascular and connective tissue structures. The general picture produced is that of so-called coagulation necrosis and the most familiar corresponding picture that I know of is in completely infarcted tissues.
>
> A very striking phenomenon, however, as brought out in the slides, is the extraordinarily rapid disappearance of the necrotic tumor. I am quite unfamiliar with anything corresponding to it. In the few microscopic preparations submitted one gets the impression that there has been very rapid solution, possibly solution by autolysis (?) of the cells including the nuclei.

UPON A TRANSPLANTABLE FOWL SARCOMA

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Some diffidence would be felt in publishing results based on the small number of observations contained in this series were it not for the fact that, when taken in conjunction with the much greater body of material reported upon in the first section of this paper, the meagerness of the observations takes on a meaning which otherwise it would not possess.

At the time when the mouse experiments were going forward one of us (H. B. A.) was propagating, for other purposes, a strain of the Rous fowl sarcoma. The material from which this strain was started in this laboratory was derived from dried powdered tumor obtained from the Rockefeller Institute for Medical Research.

The Rous fowl sarcoma is notable because it may be propagated by injection of the cell and bacteria-free filtrate of the tumor, on account of its rapidity of growth, its tendency to extensive metastasis, its virulence, and its extreme ease of inoculation. Skin tumors are readily implanted, merely by slightly scarifying the skin and rubbing thereon a bit of fresh tumor tissue.

The following experiments were performed with tumors implanted variously in the skin, comb, and wattles of chickens. The technique and methods of subjecting these tumors to the action of the high-frequency currents were the same as those used in the experiments reported in the preceding paper.

EXPERIMENT NO. 1

White Leghorn rooster No. 226.—This fowl was inoculated November 19, 1927, with Rous fowl sarcoma, in the posterior portion of the comb.

First treatment was given November 28, 1927, when tumor in comb was about 8 millimeters in diameter.

Duration of treatment, 3 minutes at a frequency of 66,000,000 cycles and a current of 350 to 300 milliamperes.

Treatment was repeated November 29, 1927. During the second treatment the treated portion of comb became cyanotic, dried up, and 14 days later dropped off, together with the tumor. Evidently in this case the treatment was unnecessarily severe, not only destroying the tumor but the adjacent comb tissues.

On January 13, 1928, this fowl was reinoculated with tumor on the skin of the right breast. Six days later it had several well-developed skin tumors in two areas of the scarifications, each collection forming an area about 8 by 10 millimeters.

On January 19, 1928, each area was treated for 3 minutes at a frequency of 68,000,000 cycles and a current of 300 milliamperes. Immediately after treatment the tumors were much less prominent and felt soft. Superficial necrosis of the skin over the treated area became evident 3 days later, leading to scab

formation. This dropped off in 10 days, leaving the skin smooth and free from tumor on February 6, 1928. This fowl is in excellent condition and tumor free at the date of writing, March 16, 1928.

EXPERIMENT NO. 2

White Leghorn rooster No. 228.—This fowl was inoculated both in the comb and on the skin of right breast on November 19, 1927, and was noted as sick and anemic at the time of inoculation.

First treatment was on November 28, 1927, when it had a tumor mass in the comb 5 millimeters or so in diameter.

This tumor was given 3 treatments of 3 minutes each at a frequency of 66,000,000 cycles and current of 300 milliamperes on November 28, 29, and December 1, 1927, with the result that on December 6, 1927, it had completely receded. The tumor implanted in the right breast had grown slowly, so that the first treatment was not given it until December 5, 1927, when it was about 5 millimeters in diameter. The frequency was 68,000,000 cycles, the duration 3 minutes, and the current 215 milliamperes. This tumor began to recede at once, but a fresh tumor developing near by was given 3 treatments of 2 minutes each on December 8, 12, and 14, after which it, too, became inactive.

The fowl's general condition, however, characterized by grave anemia, became progressively worse, so that it died on December 26, 1927.

At the autopsy no trace of tumor nor metastasis was found.

EXPERIMENT NO. 3

Full-grown Plymouth Rock rooster No. 230.—Inoculated November 19, 1927, on the left breast.

On December 1, 1927, 3 skin tumors each 4 millimeters in diameter were each given 1½ minutes' treatment at a frequency of 68,000,000 cycles and a current of 230 milliamperes. The tumors remained quiescent until December 13, 1927, when they showed signs of renewed activity. Treatments were repeated on December 14, 24, and 31, 1927, and on January 7, 1928. On January 11, 1928, a scab 10 by 10 millimeters came away, leaving a raw, healthy area which quickly cicatrized, the fowl remaining in excellent condition until February 17, 1928.

Second inoculation.—On February 17, 1928, the fowl was reinoculated with tumor in the right breast. By February 24, 1928, a small tumor 3 millimeters in diameter had developed, which grew slowly until February 28, 1928, when it received a 3-minute treatment at a frequency of 68,000,000 cycles and a current of 220 to 200 milliamperes. This halted the growth and caused the recession of the tumor mass, which had entirely disappeared by March 6, 1928.

Third inoculation.—The fowl was inoculated for the third time on the left breast March 1, 1928. By March 10, 1928, it had developed a small tumor mass on the left breast 6 millimeters long by 4 millimeters wide. This was given a treatment on that day of 3½ minutes at a frequency of 68,000,000 cycles and a current of 250 to 200 milliamperes.

At the time of writing, March 16, 1928, there are no signs of tumor activity in the treated area. It is possible that, in this case, the fowl has gained a certain degree of immunity from the first inoculation, making the second and third crop more susceptible to the treatment.

EXPERIMENT NO. 4

Full-grown Plymouth Rock fowl No. 231.—Inoculated November 19, 1927, in the skin of the right breast.

First treatment on December 3, 1927, when 2 skin tumors, each 4 by 4 millimeters, had developed. These each were given 1½ minutes' treatment at

68,000,000 cycles and a current of 250 milliamperes, with little immediate effect. Treastment was repeated next day with a duration of 2 minutes and a current of 250 milliamperes.

This case proved obstinate and intractable new suspicious massed were observed from time to time, so that treatments were repeated on December 8, 10, 13, 14, 17, 19, 24, 27, and 29, 1927, and January 3, 1928, with a total duration of 47 minutes and current values of 280 to 220 milliamperes.

As a result of these numerous treatments a large scab was formed which, when it became detached on December 27, 1927, left a triangular raw area 23 by 15 millimeters. By December 29, 1927, this raw area had shrunk to 13.5 by 8 millimeters and was completely cicatrized by January 7, 1928. At the time of writing the scar can be detected only with difficulty.

Second inoculation.—The fowl was inoculated in the skin of the left breast on February 16, 1928. This resulted in the development on February 21, 1928, of a small tumor mass measuring 6 by 4 millimeters and consisting of several coalescent tumors. On that date treatment of 3 minutes' duration at 68,000,000 cycles and current of 250 to 220 milliamperes was given. This single treatment caused the complete recession of the tumor mass on March 6, 1928.

Third inoculation.—The fowl was inoculated for the third time on the skin of the right breast on March 1, 1928, and on March 10, 1928, the first treatment to the tumor forming a small mass 6 by 4 millimeters was given, lasting 3 minutes at the same frequency and current of 220 to 210 milliamperes. At the time of writing, these tumors are apparently receding.

EXPERIMENT NO. 5

Half-grown White Rock fowl No. 246.—Date of inoculation January 13, 1928, in right breast.

Date of first treatment January 23, 1928, when it had three tumors each 3 millimeters in diameter in a row along line of inoculation. Treatment lasted 3 minutes at a frequency of 68,000,000 cycles and a current of 250 milliamperes. As there was little immediate effect, 2 minutes' additional treatment under the same conditions was given.

There was some local edema the next day, followed by slight skin necrosis. Recession of the tumors went on continuously and was complete by February 6, 1928. This chicken is tumor-free and in good health at the present time (March 17, 1928).

EXPERIMENT NO. 6

Half-grown White Rock fowl No. 247.—Inoculated January 13, 1928, in skin of right breast. Date of first and only treatment was January 23, 1928, when there were two tumors each 3 millimeters in diameter along line of inoculation. Each tumor received a treatment, 3 minutes to one and 2 minutes to the other, at a frequency of 68,000,000 cycles and a current of 250 milliamperes. There was practically no local reaction, and the tumors receded till recovery was complete on January 27, 1928.

Second inoculation.—On March 1, 1928, the chicken which had remained tumor-free and in good health was reinoculated in the skin of the same breast. By March 9, 1928, there was a new skin tumor 4 millimeters in diameter. This was treated for 3½ minutes at the same frequency with a current of 250 to 210 milliamperes. The outcome from this treatment is still under observation, but the tumor is inactive and apparently receding.

EXPERIMENT NO. 7

Half-grown White Rock fowl No. 249.—Inoculated January 13, 1928, in the skin of the right breast.

First treatment on January 23, 1928, when it had a row of tumors 23 millimeters long and 3 to 4 millimeters wide along the inoculation scratch. This tumor formation was treated in two sections, with a duration of 3 minutes to each section, at the usual frequency and a current of 300 to 250 milliamperes. There was no further tumor activity and but trifling local reaction. Recession set in almost at once and was complete by February 4, 1928.

Second inoculation.—On March 1, 1928, this chicken received a second inoculation in the skin of the same breast. By March 10, 1928, it had developed a fresh skin tumor 7 by 6 millimeters. This was treated, on that date, for 4 minutes, at a frequency of 68,000,000 cycles and a current of 270 to 220 milliamperes, the immediate effect being great softening and diminution of the tumor. There was practically no local reaction, and at the present time of writing recession is practically complete.

From the foregoing it appears that seven chickens, of which two were Plymouth Rocks, a breed known to be especially susceptible to this tumor, were inoculated a total of fifteen times with the Rous fowl sarcoma, and in each case it was possible to induce, by the treatment which has been described, a complete recession of the tumor. So much for the bright side of the shield. On the darker side are an equal number of chickens, 1 inoculated in the comb, 1 in the wattle, and 5 in the skin of the breast, in which only retardation of the tumor growth was produced, the fowls ultimately dying from extensive tumor growth.

In at least four of these chickens the basic error was too great severity of the initial treatment. This provoked an excessive local reaction with swelling and edema which masked the multiplication of the tumor cells in the adjacent areas until the tumor had obtained such a start that treatment was ineffective.

Excluding, as being too recent, the last inoculation of fowls numbered 230, 231, 247, and 249, it appears that, out of a total of 18 inoculations there were 11 recessions and 7 deaths from tumor, or 61 per cent of recessions.

It seems, with the experience gained in the experiments both with mice and chickens, that it should be possible to better this figure. Moreover, it is also possible, in the case of the Rous fowl sarcoma, that the frequency chosen for the treatments, either the same or virtually the same as that for the mouse sarcomas, might not be the frequency at which the best results would be secured with the Rous fowl sarcoma. This is obviously a point for further investigation, in view of the considerable variation in size of the cells of this sarcoma.

CONCLUSION AND GENERAL COMMENT

From the data presented in both sections of this paper the conclusion seems justified that by exposing transplantable tumors of two strains (mouse sarcoma C. R. 180 and the Rous fowl sarcoma) to the action of an intense electrostatic field excited by high-frequency oscillations of 68,000,000 to 66,000,000 cycles per second, it is possible in a sufficient number of instances to be significant, to produce complete recession of the tumor and consequent recovery of the tumor-bearing animal.

The method, in its present state of development, has obvious limitations in that it is confined to the treatment of subcutaneous growths which can readily be included between the plates of the treatment electrodes. Within these limitations, however, the action of the electrostatic field proved highly inimical to tumor growth and development, only 22, or 5.5 per cent, of 400 mice experimented with actually dying of tumor. With mice the problem was not so much the destruction of the tumor as to preserve the mouse free from intercurrent infections until complete recession and solid recovery had taken place.

The impression was derived that mice which had undergone treatment were, for a time at least, more susceptible than normal mice to certain bacterial infections, which brought about many more deaths than did the tumors. The treatment, too, when a certain dosage was exceeded, was able of itself to cause death. Also the lack of experience as to correct dosage, proper insulation of electrodes, and similar factors was responsible for a considerable mortality which in future experiments it should be possible to avoid.

Since stable and efficient apparatus for generating these high-frequency currents has been available to the laboratorian only for about four years or so, the action of these currents on living tissues has been but little investigated. Certainly, no previous data of practical value as to physiological action were available for guidance in the experiments here reported.

Even now we are evidently only on the threshold of the possibilities for investigation. Much remains for study, particularly with respect to the changes wrought in living cells by the application, in this particular way, of these currents. Studies along these lines are now under way and will be made the subject of future report.

The hypothesis that the frequency at which these currents are produced may have the specific quality of attacking certain cells more than others is interesting and worthy of future experimentation. Observations already collected suggest that this may be the case. The first paper published on the action of those currents, to which

reference has been given, shows plainly that their action at all frequencies is not the same but that pronounced differences exist.

In a small series of experiments a much higher frequency (135,000,000 cycles per second) than the one usually employed proved to be without particular effect on the tumor cells of the mouse sarcoma, while a preliminary study of sections of treated tumors removed immediately after exposure shows that normal tissue cells surrounding the tumor seem to be less attacked by the high-frequency currents than the tumor cells themselves.

So far as the possible therapeutic application of this method and these currents to human disease is concerned, a considerable period of observation and investigation is required before one would be justified in making such attempts, although one may hope that the results of animal experimentation foreshadow, albeit though dimly at present, results which may well be of practical utility.

Finally, it may be said that the results herewith reported distinctly encourage further investigation and study. The hope is expressed, too, that others will investigate this field with its many seeming possibilities and thereby increase the likelihood of recording observations which may be susceptible of practical application

EFFECT OF CERTAIN TRADE WASTES ON SLUDGE DIGESTION [1]

By WILLEM RUDOLFS, *Chief, Department of Sewage Disposal, New Jersey Agricultural Experiment Station, New Brunswick, N J*

Little direct and reliable information concerning the influence of trade wastes upon sludge digestion is available. A thorough study of the subject will no doubt yield important results. Preliminary studies were conducted during 1927 in our laboratory, the results of which are worthy of reporting.

Fresh solids were collected in the usual manner by hanging pails in the different compartments of an Imhoff tank. The contents of the pails were mixed and brought to the laboratory. Forty-eight hours elapsed between the time of hanging the pails and that of making the initial analyses. The ripe sludge used had been kept for some time previously in the laboratory after having been drawn from the tank. The anlyses of the fresh solids and ripe sludge were as follows:

Material	Solids		pH	Alkalinity, p p m	Acidity, p p m.
	Per cent	Per cent of ash in			
Fresh solids	5 56	22 3	5 3	600	154
Ripe sludge	6 52	48 2	7 5	2,100	44

[1] Paper No. 59, Department of Sewage Disposal, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

The fresh solids were mixed with ripe sludge in proportions of 1 : 1 on a dry solids basis, or of 1 : 1.28 on the basis of volatile matter. To the mixtures were added different wastes, mainly of an inorganic nature. The additions of waste material made it imperative that all mixtures be diluted with distilled water. In those cases in which laundry waste, dye waste, and H_2SO_4 were added, the amount of distilled water for diluting was smaller in proportion. On the basis of diluted mixtures the following amounts of the different materials were added per liter:

No.	Waste
1	Nothing [1]
2	Laundry, 10 per cent by volume.
3	Sulphur-black dye, 5 per cent by volume.
4	Sulphuric acid, 500 p. p. m.
5	Sulphuric acid, 1,000 p. p. m.
6	Sodium hydroxide, 500 p p m.
7	Sodium hydroxide, 1,000 p. p. m.
8	H_2SO_4, 500 p. p. m. and NaOH, 500 p. p. m.
9	$FeSO_4$, 3 gm.

[1] See analyses and description.

The laundry waste was secured from a commercial laundry and contained 500 p. p. m. chlorides, 640 p. p. m. NaOH, 81,000 p. p. m. total alkalinity.

The sulphur-black dye was liquid from a vat in which stockings had been dyed. No wash water was included and the liquid corresponded, therefore, to the material in a concentrated form received at a sewage plant. The amount added (10 per cent on the basis of fresh solids) is probably higher than is ordinarily received. The material was collected at High Point, N. C. For convenience and for the general interest the following calculations are made for that city.[3]

According to the secretary of the Chamber of Commerce at High Point, the population of the city is 30,000. Part of the city is not sewered and Mr. Weir felt that the figure should be in the vicinity of 25,000. The average flow at the outfall was about 2,250,000 gallons per day. This includes about 160,000 gallons of industrial waste from the hosiery mills. The materials used in the sulphur-black dye process are listed below with the total amounts used in all the 12 hosiery mills. These figures cover the chemicals added to the dye vats, but do not show the actual amount which goes to the sewer, because much of the dye material is obviously retained in the hosiery stock. However, the relative amounts of these various constituents in the waste as discharged are probably the same as in the fresh dye.

[3] I am indebted to Mr. Weir, assistant engineer, North Carolina State Board of Health, and to Mr. W. C. Olsen, consulting engineer, Raleigh, N. C., for some of the basic figures given here.

Material	Pounds per day
Sulphur-black dye	550
Sodium chloride	550
Sodium sulphide	550
Sodium carbonate	175

In addition to the sodium chloride shown in the tabulation, about 300 pounds are used in the various other dye processes. This must be added to the 550 pounds for a total. However, since only black-sulphur dye waste with the relative proportions of the ingredients was used in the experiment, the latter 300 pounds of sodium chloride must be left out here. As nearly as could be determined analytically (highly colored liquor) the amounts of chemicals in the waste used in the experiment were as follows:

	Per cent
Total solids	5.38
Dye	1.2
Sodium chloride	2.0
Sodium sulphide and sulphates	1.6
Sodium carbonate	0.6

The amount of dye was determined by absorption with washed-neutral-decolorizing carbon (Nuchar from the Ind. Chemical Co., New York).

About 7 per cent of the total sewage flow consisted of dye waste. On a basis of dry solids (assuming that the average amount of dry solids per capita daily is 70 grams, the amount of fresh solids received at the plant would be 1,750 kilograms. The dye waste together with the wash water has a volume of 160,000 gallons daily making a total of 405 kilograms dry additional waste, or 18.8 per cent of the total. The waste increase would require, therefore, a disposal plant with a capacity for 29,700, or, roughly 30,000, people if no detrimental effect was experienced from the waste. The amount of waste used in our experiments was three times as much as is received at High Point. The results included here are given because they show the possible effect on digestion with larger quantities.

RESULTS

The initial analyses of the mixtures in this series (No. 404) are given in Table 1.

TABLE 1.—*Initial analyses of mixtures*

No.	Mixture	Solids: Per cent	Solids: Per cent of ash in	pH
1	Ripe sludge, fresh solids	3.01	35.2	6.8
2	Ripe sludge, fresh solids, laundry waste	3.02	35.3	6.8
3	Ripe sludge, fresh solids, dye waste	3.02	35.5	7.0
4	Ripe sludge, fresh solids, H_2SO_4 (500 p. p. m.)	3.05	35.2	5.6
5	Ripe sludge, fresh solids, H_2SO_4 (1,000 p. p. m.)	3.10	35.5	5.2
6	Ripe sludge, fresh solids, NaOH (500 p. p. m.)	3.05	35.4	7.8
7	Ripe sludge, fresh solids, NaOH (1,000 p. p. m.)	3.10	35.6	8.4
8	Ripe sludge, fresh solids, H_2SO_4, NaOH (1,000 p. p. m.)	3.10	35.7	6.7
9	Ripe sludge, fresh solids, $FeSO_4$	3.14	35.7	6.5

The progress of digestion of the different mixtures was markedly different. In every case where H_2SO_4 was added, strong H_2S odors emanated from the mixtures. This was also the case with the mixture to which dye was added. Condensed notes on the odor, gas, appearance of liquid and sludge, and scum formation, after 20 and 30 days, are given in Table 2.

TABLE 2.—*Notes on consistency and odor of mixtures*

No.	After 20 days				
	Solids, top	Liquid	Odor	Sludge color	Gas
	Per cent				
1	0	Opaque	Musty	Grayish green	Much.
2	0	Yellow	do	do	Do.
3	0	Dense gray	do	do	Some.
4	50	Very dense	H_2S	Black	Much.
5	50	Black	do	Gray	Little.
6	0	Opaque	None	Gray, black	Much.
7	0	Yellow	do	do	Do.
8	0	Opaque	Ripe	Black	Do
9	0	Clear	do	do	Do.

No.	After 30 days				
	Solids, top	Liquid	Odor	Sludge	Drain ability
	Per cent				
1	0	Clear	Ripe	Black	Very good
2	0	Opaque	Tarry	do	Do
3	0	Dense	H_2S	Intense black	Fairly good
4	20	Very dense	Strong H_2S	do	Poor
5	15	do	Putreactive H_2S.	Gray	Some
6	0	Clear	Ripe	Black	Good
7	0	Opaque	Tarry	do	Very good.
8	0	Clear	H_2S	do	Do.
9	0	Very clear	Ripe	do	Do.

After 60 days, Nos. 3, 4, 5, and 8 still had strong H_2S odors, but decomposition of organic matter progressed very slowly. The H_2S odor was still perceptible in No. 3, and very strong in No. 5 after 100 days of incubation. Apparently, practically all the sulphuric acid was eventually changed partly to H_2S and partly to sulphur, which was precipitated out against the walls of the bottle, causing a thin yellow coating. Finally, this precipitated sulphur disappeared again, probably being oxidized to sulphates and combining with alkaline products formed in the course of decomposition of organic materials. The whole question, which deals with the sulphur cycle, is under further investigation at the time of this writing.

Part of the chemical results obtained are presented in Table 3, and the percentage solids reduction and ash increase, together with relative values for solids reduction, are given in Table 4. Table 4 shows that the addition of laundry waste had a slight effect on the digestion activities. The sulphur-black dye waste was particularly

detrimental, which effect was no doubt caused by some of the inorganic salts. Comparatively small quantities of H_2SO_4 did not seem to affect the digestion process at the beginning, and appeared actually to stimulate it after an incubation period of 60 days; larger quantities of H_2SO_4 appeared to be detrimental even after 60 days. A mixture of NaOH and H_2SO_4 seemed to be detrimental at the beginning, but this was reversed later. Small quantities of NaOH appeared to retard the digestion slightly, and larger quantities more. The particular quantity of iron sulphate added in the case recorded here was slightly detrimental at the beginning.

TABLE 3.—*Chemical determinations of mixtures*

No.	After 30 days				After 60 days				After 100 days	
	pH	Alkalinity	Solids	Ash in solids	pH	Alkalinity	Solids	Ash in solids	Solids	Ash in solids
		P. p. m.	*Per cent*	*Per cent*		*P. p. m.*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
1	7.6	1,240	2.11	47.1	7.4	870	2.05	47.6	--	--
2	7.4	1,430	2.24	47.6	7.5	1,215	2.22	49.7		
3	7.5	1,425	2.64	48.1	7.9	1,365	2.41	47.9	2.29	50.2
4	7.2	1,020	2.19	44.6	7.7	960	1.92	45.2	--	--
5	6.3	450	2.49	39.4	7.2	695	2.41	52.1	1.94	53.2
6	7.5	1,545	2.32	48.2	7.3	825	2.12	46.8	--	--
7	7.7	1,860	2.43	45.9	8.0	1,200	2.30	50.5	2.20	52.6
8	7.6	1,320	2.43	49.7	7.9	900	2.05	44.0	--	--
9	7.5	1,335	2.30	47.1	7.5	720	2.30	50.5	2.17	50.2

TABLE 4.—*Percentage solids reduction and ash increase, and relative solids reduction*

No.	30 days		60 days		100 days		Relative reduction	
	Solids	Ash in solids	Solids	Ash in solids	Solids	Ash in solids	30 days	60 days
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*		
1	29.9	33.8	31.8	35.2			100	100
2	26.4	34.0	26.4	40.7			90	90
3	13.2	36.6	19.2	34.9	31.4	42.6	43	63
4	28.8	25.6	33.7	28.4			97	113
5	20.7	10.7	21.3	46.7	37.4	49.8	70	70
6	24.7	35.8	30.1	32.2	--	--	83	100
7	22.6	28.5	25.8	41.9	29.0	52.6	77	87
8	22.6	39.2	33.9	41.7			77	113
9	26.8	31.9	30.0	41.2	30.8	40.6	90	100
Ripe sludge	9.5	6.9	9.8	12.5		--	--	--

The effect of sulphur-black dye waste on sludge digestion was further studied in a somewhat different way. It was assumed that a city of 25,000 people would produce about 3,860 pounds of dry fresh solids daily. Assuming a removal of suspended solids of 60 per cent by settling, a plant would have to take care of 2,320 pounds of dry fresh solids daily. It was also assumed that out of 1,825 pounds dye waste used, 50 per cent would reach the sewer (900 pounds) and remain in contact with the solids for six hours before the fresh solids would be settled out.

The following experiments were then performed. To mixtures of ripe sludge and fresh solids in the ratio of 1:1 on a dry basis were

added different amounts of dye waste. The amount of dye waste was calculated to be approximately on the basis assumed above.

The following amounts were added on the basis of dry fresh solids:

No.	Fresh solids	Dye waste	No.	Fresh solids	Dye waste
	Gram	*Gram*		*Gram*	*Gram*
1	25	0	3	25	0.5
2	25	1.0	4	25	.25

The ripe sludge fresh solids used for the mixtures analyzed as follows:

Material	Solids		Volatile matter, per cent
	Per cent	Per cent of ash in	
Ripe sludge	6.90	45.1	3.80
Fresh solids	5.17	20.5	4.13

The mixtures with the different quantities of dye waste added were diluted with distilled water, shaken, and left standing for six hours, and thereafter two-thirds of the supernatant liquid was

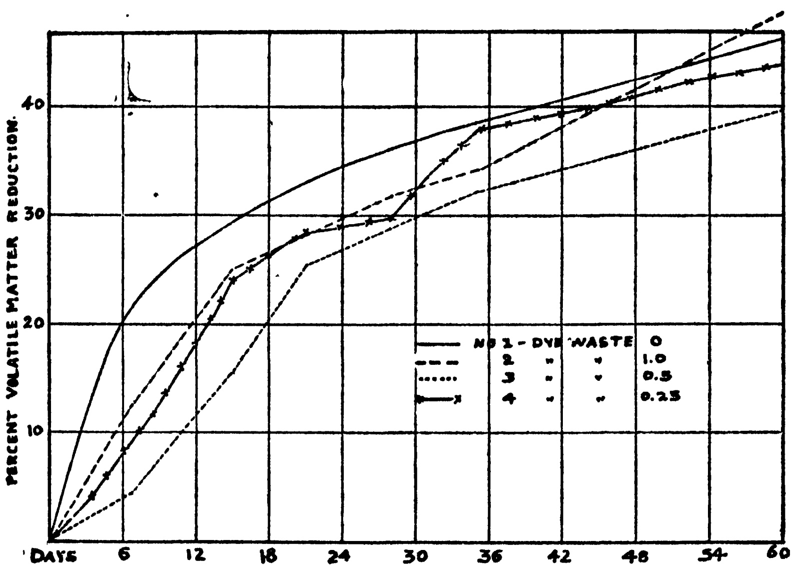

FIG. 1.—Effects of different amounts of dye waste on the percentage volatile matter reduction

siphoned off. The mixtures were then incubated at 70° F. and analyzed at intervals. The results after 35 and 60 days are given in Table 5. It can be seen that, under this procedure, the effect of the dye waste was considerably less than it was in the experiment with

larger quantities reported above. Within a week the mixtures with the dye waste produced strong H_2S odors. In 14 days this odor had disappeared from the mixture with the smallest amount of dye waste, but it took more than 5 weeks before this odor disappeared from the mixture to which the largest quantity of dye waste was added. That the dye waste had a retarding effect is clearly shown in Figure 1, where the volatile matter reduction is plotted for the entire digestion time

TABLE 5.—*Effect of dye waste on volatile matter reduction and ash increase*

No.	Beginning			35 days			60 days			Volatile matter reduction		Ash increase	
	pH	Solids	Ash in solids	pH	Solids	Ash in solids	pH	Solids	Ash in solids	35 days	60 days	35 days	60 days
		Per cent	*Per cent*		*Per cent*	*Per cent*		*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
1	6.7	3.45	35.4	7.6	2.58	46.7	7.3	2.56	47.0	38.5	46.2	31.8	32.8
2	7.7	3.98	37.5	7.6	3.11	47.3	7.6	2.62	49.3	34.1	48.2	26.2	31.5
3	7.2	3.37	39.0	7.4	2.68	47.5	7.8	2.50	49.5	32.0	38.8	21.8	26.9
4	7.0	3.36	38.0	7.6	2.37	45.9	7.7	2.48	47.1	38.4	43.8	20.8	23.9

SUMMARY

Preliminary studies on the effect of certain trade wastes upon the rate of sludge digestion show that with seeded material—

1. Laundry waste is somewhat detrimental to digestion activities.
2. Sulphur-black dye waste is particularly detrimental when left in contact with the sludge. It is detrimental to a much lesser extent in the digestion of fresh solids when the dye wast is partly removed with some of the supernatant liquid.
3. Comparatively small quantities of H_2SO_4 did not seem to affect digestion processes markedly during the first stages of digestion, and appeared to stimulate them somewhat after a prolonged period of incubation. Larger quantities appeared to retard
4. Small quantities of NaOH retarded activities slightly and larger quantities more.
5. A mixture of NaOH and H_2SO_4 seemed to be detrimental at the beginning, but this was reversed later
6. Certain proportions of iron sulphate have little effect on digestion.

PUBLIC HEALTH INSTITUTE AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

The second Public Health Institute for health officers and other public health workers will be held at the Massachusetts Institute of Technology, Cambridge, Mass., from July 2 to 24, 1928.

This institute aims to provide for the health officers and other persons interested in health work, and opportunity to study public-

health procedures and to examine modern public-health practices under the direction of experts in their respective fields.

Practitioners of medicine frequently spend a few weeks in observation and study at great clinical centers with advantage. In this Institute of Public Health it is hoped to provide an equally valuable type of experience for health officers, public-health nurses, and other persons actively engaged or interested in public-health activities. Its main purpose is intensive instruction in the essential principles and the presentation of the best methods of modern practice in some of the important aspects of public-health work.

It is desired that application for this course be made before June 15, 1928.

Further information may be had by addressing Prof. S. C. Prescott, Department of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass.

COURT DECISION RELATING TO PUBLIC HEALTH

Supreme Court Interprets and Upholds Constitutionality of the Harrison Antinarcotic Act

Provision of antinarcotic act making sale, etc., of narcotic drugs unlawful except in pursuance of written order on official form construed and held constitutional.—(United States Supreme Court; Nigro *v.* United States; decided April 9, 1928.) The United States Circuit Court of Appeals for the Eighth Circuit submitted for the consideration of the United States Supreme Court four questions concerning the validity and proper construction of the Harrison Antinarcotic Act of December 17, 1914 (38 Stat. 785), as amended by the revenue act of 1918 (40 Stat. 1130). Questions I and II which were submitted read as follows:

> *Question I.*—Is the provision which is contained in the first sentence of section 2 of the act limited in its application to those persons who by section 1 are required to register and pay the tax?
>
> *Question II.*—If a broader construction is given to said provision, is the provision as so construed constitutional?

The first sentence of section 2 of the antinarcotic act provided:

> That it shall be unlawful for any person to sell, barter, exchange, or give away any of the aforesaid drugs except in pursuance of a written order of the person to whom such article is sold, bartered, exchanged, or given, on a form to be issued in blank for that purpose by the Commissioner of Internal Revenue.

The Supreme Court answered the first question in the negative and the second question in the affirmative, making it unnecessary to answer the third and fourth questions. Following are extracts from the court's opinion:

In interpreting the act, we must assume that it is a taxing measure, for otherwise it would be no law at all. If it is a mere act for the purpose of regulating and restraining the purchase of the opiate and other drugs, it is beyond the power of Congress and must be regarded as invalid, just as the child labor act of Congress was held to be, in *Bailey, Collector*, v. *Drexel Furniture Company*, 259 U. S. 20. Everything in the construction of section 2 must be regarded as directed toward the collection of the taxes imposed in section 1 and the prevention of evasion by persons subject to the tax. If the words can not be read as reasonably serving such a purpose, section 2 can not be supported.

The importation, preparation, and sale of the opiate or other like drugs and their transportation and concealment in small packages are exceedingly easy and make the levy and collection of a tax thereon correspondingly difficult. More than this, use of the drug for other than medicinal purposes leads to addiction and causes the addicts to resort to so much cunning, deceit, and concealment in the procurement and custody of the drug and to be willing to pay such high prices for it that, to be efficient, a law for taxing it needs to make thorough provision for preventing and discovering evasion of the tax—as by requiring that sales, purchases, and other transactions in the drug be so conducted and evidenced that any dealing in it where the tax has not been paid may be detected and punished and that opportunity for successful evasion may be lessened as far as may be possible.

The literal meaning of "any person," in the first line of the first sentence of section 2, includes all persons within the jurisdiction. The word "persons" is given expressly the meaning of a partnership, association, or corporation, as well as that of a natural person. Why should it not be given its ordinary comprehensive significance? The argument to the contrary in favor of limiting it to exclude all but those who are required to register and pay the tax is that it would be superfluous to include persons selling opium who are not registered because they are denounced as criminals by the first section for selling without registration. That is no reason why they may not be included under a second reasonable restriction enforceable by punishment. Of course such a restriction should be fairly adapted to obstruct the successful accomplishment of the main crime or furnish means of detecting the guilty person, and not be a fruitless, useless inhibition only resulting in what is in effect a duplication of punishment for substantially the same crime, as in the case of *United States* v. *Katz*, 271 U. S. 354, 362

It would seem to be admissible and wise in a law seeking to impose taxes for the sale of an elusive subject to require conformity to a prescribed method of sale and delivery calculated to disclose or make more difficult any escape from the tax. If this may be done, any departure from the steps enjoined may be punished, and added penalties may be fixed for successive omissions, but all for the one ultimate purpose of making it difficult to sell opium or other narcotics without registering or paying the tax.

The reasonableness of such requirements is well illustrated in the many limitations which were imposed upon the ancient freedom in the making and sale of distilled spirits to the end that the collection of the heavy tax on the subject matter might be successfully secured in spite of the temptation to avoid the tax. The provision of section 2 making it an offense to sell unless the purchaser gives a particular official form of order to the seller was enacted with a like object. The sale without such an order thus carries its illegality on its face. Its absence dispenses with the necessity of sending to examine the list of those registered to learn whether the seller is engaged in a legal sale. The requirement that the official forms can only be bought and obtained by one entitled to buy, whose name shall be stamped on the order form, and that after the sale the order form

shall be recorded, effects a kind of registration of lawful purchasers, in addition to one of lawful sellers, and keeps selling and buying on a plane where evasion of the tax will be difficult.

There are persons who may lawfully have access to or even custody of the drugs without registration. Thus included among such persons are the employees of those who have registered and paid the tax. If they were to attempt to sell such drugs the necessity for an order form from the would-be purchaser would embarrass the illegal sale, for the participants would hesitate to make a record of the transaction. Thus the operation of section 2 in preventing an individual not a registered dealer or physician from acquiring the drug other than by an order form or a prescription is directly related to tax enforcement, because such drugs are not necessarily consumed by the purchaser but may be peddled or sold illegally. These order-form provisions constitute a needed check on illegal sales and they are distinctly helpful in the detection of an attempted dealing in, or selling of, the drug free from the tax.

Section 2 of the act is the same as it was when originally passed in 1914. The construction put upon it before the amendment of section 1, by the revenue act of 1918, must be the same now as before. Under section 1 in the original act, the only provision to keep track of purchasers was the order form provision of section 2, as it is now. Without it, unless it applied to those not required to register or pay the tax, there was no restriction upon such persons whether illegal sellers or illegal purchasers in the disposition and spread of the drug, except the simple punishment for unregistered sellers in the first section, and there was entire immunity from order requirements of the purchasers from illegal sales. We can not suppose that, considering the general language of section 2, any such result was intended by Congress.

By the amendment of section 1, much higher occupation taxes were imposed and they vary in amount for producers and manufacturers and for wholesale and retail dealers and for physicians. More than that, an excise tax of one cent per ounce of the drug is imposed and payment thereof is to be evidenced by stamps attached to the bottle or box containing the drug, and the sale of the drug from anything but a stamped bottle or container is punishable. The provision for order forms is thus useful under the amended section, and there is therefore still reason for holding the provisions of section 2 to apply to all persons so as to be helpful in promoting detection of evasion from the added tax imposed under the new section 1. The two tax provisions of that section would be much less effective if a purchaser of drugs from an unregistered dealer is not required to furnish an order form. The purchaser may be himself one who should register, but has not done so, or he may be dealing in and selling the drug on which the stamp tax has not been paid and it is just as important that sales by an unregistered dealer should be punished unless made on a prescribed form as that sales by registered dealers should be subject to penalty.

* * * * * * *

Section 2 of the antinarcotic act introduces into the act the feature of the required and stamped order form to accompany each sale. It is to bear the name of the purchaser, and is addressed to the seller, with other data. Recorded as the law requires it to be, it constitutes a registry of purchasers, as distinguished from that of sellers. Congress intended not only to punish sales without registration under the first section, but also to punish them without order forms from the purchaser to the seller as a means of making it difficult for the unregistered seller to carry through his unlawful sales to those who could not get order forms. Thus an illegal unregistered seller might wish to clothe his actual unregistered sales with order forms that would give the transaction a specious appearance of legality. To punish him for this misuse of an order form is not to punish

him for not recording his own crime. It is to punish him for an added crime—that of deceiving others into the belief that the sale is a lawful sale There is no incongruity in increasing the criminal liability of the nonregistered seller who fails to use an order form in his sales, or who misuses it. Both the registered and the nonregistered seller are, under our construction of the section, punished for not using the order forms as the statute requires, or for misusing them. The order form is not a mere record of a past transaction—it is a certificate of legality of the transaction being carried on, or else it is a means of discovering the illegality and is useful for the latter purpose. * * *

We are of opinion, therefore, that the provision which is contained in the first sentence of section 2 of the act is not limited in its application to those persons who by section 1 are required to register and pay the tax. We answer the first question in the negative.

This brings us to the second question, which is "* * * is the provision as so construed, constitutional?" It was held to be constitutional in *United States* v. *Doremus,* 249 U. S. 86, 94. * * *

Four members of the Court dissented in the *Doremus case,* because of opinion that the court below had correctly held the act of Congress, in so far as it embraced the matters complained of, to be beyond its constitutional power and that the statute, in section 2, was a mere pretext as a tax measure and was in fact an attempt by Congress to exercise the police power reserved to the States and to regulate and restrict the sale and distribution of dangerous and noxious narcotic drugs. Since that time, this court has held that Congress by merely calling an act a taxing act can not make it a legitimate exercise of taxing power under section 8 of Article I of the Federal Constitution, if in fact the words of the act show clearly its real purpose is otherwise. *Child Labor Tax Case,* 259 U. S. 20, 38. By the revenue act of 1918, the antinarcotic act was amended so as to increase the taxes under section 1, making an occupation tax for a producer of narcotic drugs $24 a year, for a wholesale dealer $12, for a retail dealer, $6, and for a physician administering the narcotic, $3. The amendment also imposes an excise tax of one cent an ounce on the sale of the drug. Thus the income from the tax for the Government becomes substantial Under the narcotic act, as now amended, the tax amounts to about one million dollars a year, and since the amendment in 1919 it has benefited the Treasury to the extent of nearly nine million dollars. If there was doubt as to the character of this act as an alleged subterfuge, it has been removed by the change whereby what was a nominal tax before was made a substantial one. It is certainly a taxing act now as we held in the *Alston case.*

It may be true that the provisions of the act forbidding all but registered dealers to obtain the order forms has the incidental effect of making it more difficult for the drug to reach those who have a normal and legitimate use for it, by requirement of purchase through order forms or by physician's prescription. But this effect, due to the machinery of the act, should not render the order form provisions void as an infringement on State police power where these provisions are genuinely calculated to sustain the revenue features. The section 2 was once sustained by this court some nine years ago with more formidable reason against it than now exists under the amended statute. Its provisions have been enforced for those years. Whatever doubts may have existed respecting the order form provisions of the act have been removed by the amendment made in 1919.

* * * * * * *

In this case the qualification of the right of a resident of a State to buy and consume opium or other narcotic without restraint by the Federal Government is subject to the power of Congress to lay a tax by way of excise on its sale. Con-

gress does not exceed its power if the object is laying a tax and the interference with lawful purchasers and users of the drug is reasonably adapted to securing the payment of the tax. Nor does it render such qualification or interference with the original State right an invasion of it because it may incidentally discourage some in the harmful use of the thing taxed. *License Tax Cases*, 5 Wall. 462; *Nicol* v. *Ames*, 173 U. S. 509, 524; *Knowlton* v. *Moore*, 178 U. S. 41, 60, 61; *In re Kollock*, 165 U. S. 526, 536.

This leads to an answer to the second question in the affirmative, and makes it unnecessary for us to answer the remaining third and fourth questions.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Irrigation with Sewage Effluent. W. A. Riney. Proceedings Tenth Texas Water Works Short School, January, 1928. (Abstract by Jane H. Rider.)

Abilene, Tex., has successfully disposed of its sewage for 25 years by allowing farmers, under contract, to use the effluent from the septic tanks for broad irrigation The 400 acres of farm land available are sufficient to dispose of the 2 acre-feet per day effluent without creating a nuisance. Farms irrigated with the effluent are much more productive than adjoining land which is not irrigated. The State hospital at Abilene also successfully irrigates its farm with the effluent from its septic tank.

Climatological data obtained from the United States Weather Bureau at Abilene are given, together with a classification of the soils of Taylor County made by the United States Bureau of Soils.

The essential requirements for successfully disposing of sewage effluent by broad irrigation are (1) an ample acreage of well-drained soil in an isolated location; (2) intelligent cultivation of crops; (3) provision for storing the effluent when the land can not be irrigated.

Pont Burn Joint Sewage Disposal Works, Leadgate Co., Durham. Anon. *The Surveyor*, vol. 72, No. 1875, December 30, 1927, pp. 635–636. (Abstract by H. W. Streeter.)

The sewage disposal works, which were opened November 3, 1927, are joint between the urban district of Leadgate and the rural district of Lanchester. They were designed to treat 130,000 gallons per day, d. w. f., with allowance for 20 gallons per person daily. They consist of 2 detritus tanks, 4 sedimentation tanks, dosing chamber, storm-water tank, 3 percolating filters, and 2 humus tanks. All units except the humus tanks are placed adjoining one another. Filters are circular and dry walled, with air-lock sprinklers 73 feet in diameter. Total cost of the works was £9,600, or about $48,000.

Sludge Drying and Disposal. F. E. Daniels. Proceedings of First Conference of Sewage Works Operators, Pennsylvania State College, July 13–14, 1926. Tech. Bulletin No. 1, pp. 46 48. (Abstract by J. B Harrington.)

In this article sludge drying and disposal is described briefly. Sludge should be well rotted before draining to enable it to give up water readily and reduce odors. The percentage of water contained in various volumes of sludge is given in a table. Bad weather is often a handicap to successful sludge drying even with properly designed and constructed beds.

Three requisites for a well designed sludge bed are (1) sufficient underdrains; (2) a deep bed of properly graded material; (3) a clean surface of fine material.

Operation of Milwaukee Sewage Treatment Plant. Robert Cramer and John Arthur Wilson. *Public Works*, vol. 59, No. 1, January, 1928, pp. 20–23. (Abstract by R. J. Faust.)

This article outlines the treatment equipment available, the operating results, operating difficulties, operating cost, and future improvements at the Milwaukee activated sewage treatment plant.

The purification, judged by removal of suspended solids, bacteria count, or oxygen demand, is practically perfect. Operating difficulties arose from some inadequate equipment, lack of skill in operation, and an inadequate operating force. Organization of operating force, cost of repairs, and coal have added greatly to the past operating cost. Studies with experimental treatment plants prove that the city's sewage can be treated at three times the rate in gallons per cubic foot of air, as compared with the main plant, and have produced a sludge that can be successfully filtered, giving rise to the hope that a considerable saving can be accomplished in the future.

Odor Nuisances at Sewage Works—The Use of Chlorine. L. H. Enslow. *The Surveyor*, vol. 73, No. 1880, February 3, 1928, pp. 183 184. (Abstract by H. W. Streeter.)

Emanating from sewers and sewage plants are several different odors. Hydrogen sulphide has been shown to be the most serious of the odor-producing gases and is also destructive to masonry structures.

In odor control, prevention rather than destruction is a chief objective. The introduction of chlorine at a point where sewage is fresh is important, though frequently the sewage becomes stale before a major portion of it can be collected for treatment.

Where odor production exists, the following conditions seemingly must occur simultaneously: (1) Presence of sulphates, (2) hydrogen sulphide-producing bacteria, (3) temperature sufficiently high to promote rapid growth of sulphide-splitting organisms, and (4) period of time necessary for producing hydrogen sulphide Elimination of but one of these factors will result in securing effective control of hydrogen-sulphide generation. Odor destruction consists primarily in splitting up the hydrogen sulphide in sewage

Another factor in odor control is the effect of the course of the sewage, whereby an intimate mixture may be caused between fresh sewage and liquid heavily laden with hydrogen sulphide. Saving in chlorine consumption may be effected by changes in flow chambers to prevent disturbance of the lower 5 feet of liquid in the chamber. Chlorine application to the influent will effect complete odor elimination at moderate expense. On the whole, odor control is much more readily effected at separate sludge digestion plants.

In conclusion, examples are given of chlorination for odor control at Neodesha and Independence, Kans.

Developments in Sewage Treatment. G. G. Nasmith. *The Surveyor*, vol. 73, No. 1880, February 3, 1928, pp. 179 180. (Abstract by H. W. Streeter)

This article is a review of progress in sewage treatment during the year 1927, under the headings: Activated sludge process, colloiders, fine screens, removal of oil, sludge digestion and treatment, storm-water tanks, sewage chlorination, sewage-treatment mechanisms, and pollution of water supplies.

The author notes that although no great discoveries were made during the year, a steady accumulation of new knowledge and confirmation of earlier observations have taken place, together with the establishment of numerous chemical, physical, and biological facts. He notes especially the results of chlorination of raw **sewage in respect to prevention of Imhoff tank foaming and of excessive film formation on trickling filters, and the improvements in sludge digestion effected by pH adjustment, by daily addition of small amounts (not over 2 per cent) of fresh solids and by temperature adjustment to an optimum of 80° F.**

The difficulties involved in the operation of the activated sludge method and the means of overcoming them are discussed in detail; likewise those entailed in

the digestion of sludge. The increasing attention being devoted to stream pollution and to the creation of river boards is emphasized.

Spent Gas Liquor in Relation to Sewage Disposal. H. Ross Hooper, *The Surveyor*, vol. 73, No. 1879, January 27, 1928, pp. 111–112. (Abstract by H. W. Streeter.)

Spent gas liquor is dangerous to fish life and cattle and detrimental to small streams, as its oxygen-absorbing qualities prevent and retard self-purification. The difficulties of dealing with gas liquor have become more acute because of (*a*) the increased manufacture of gas for domestic uses; (*b*) the introduction of vertical retorts with use of steam, thereby increasing the volume of gas liquors; and (*c*) the adoption of the activated sludge method of sewage disposal. With vertical retorts, 76 gallons of spent liquor are produced per ton of coal, whereas with horizontal retorts 50 gallons are produced. The efficiency of the activated sludge process is likely to be affected by the presence of unduly high amounts of spent gas liquor in the sewage treated. Because of its high oxygen-absorption power the admixture of the spent liquor with crude sewage requires greater aerobic activity in the treatment of such mixtures, usually necessitating an increased purifying area.

It is possible, by several measures named, to diminish the amount of gas liquor produced; likewise to purify the liquor before its discharge into sewers. In the latter connection it is noted that if the volume of spent gas liquor does not exceed 1 per cent of the volume of domestic sewage and is introduced into the sewers in a small steady flow, the mixture can be purified without difficulty. Experiments made on treatment of the spent liquor, have indicated that when diluted until the 4-hour oxygen absorption value is 4,000 p. p. m., the liquor itself is amenable to biological filtration, which, at a rate of 15 gallons per cubic yard per day of 8 hours, reduced the oxygen absorbed by 90 per cent, and a second filtration at a rate of 12 gallons per cubic yard produced an effluent absorbing less than 20 p. p. m of dissolved oxygen.

In conclusion, it is stated that the discharge of spent gas liquors into sewers should be, as far as possible, uniform and proportionate to the flow of domestic sewage. The construction of equalizing tanks for this purpose offers no engineering difficulties.

Gas from the (Berlin) Sewage Settling Plant at Wassmansdorf. F Langbein. Gas. u. Wasserfach 70, 1109–18 (1927); cf. C. A. 21, 4000. Abstract by R. W. R. in *Chemical Abstracts*, vol. 22, No. 3, February 10, 1928, pp. 472–473.

"Sewage from the Neukoln and Shonberg areas of Berlin are clarified by settling tanks of the Ems or Imhoff type so that the effluent can be used for irrigation without 'baking' the soil. The Ems wells or basins are of the 'two-story' type, the settling basin comprising the upper part and the fermentation chamber the lower part. The separated slime slides through slits in the settling chamber into the fermentation chamber. About six months are required to 'work in' a fermentation chamber so that it is odorless and the cellulose fermentation is well established and capable of taking care of regulated amounts of fresh slime. At this time the gas produced by the fermentation consists of 70–80 per cent CH_4, with the balance largely CO_2. The resultant slime (after fermentation) is black, easily handled, smells slightly like rubber, and may be dried on suitable beds. It contains much humus and may be used agriculturally. Three hundred and fifty thousand cubic feet of sewage per day are treated in this way and fermenting capacity must be provided for three months. The slime is almost completely settled out in 45–50 minutes. The gas produced will average about 200,000 cubic feet per day, although 50 per cent greater may be produced in hot weather and 30 per cent less in cold weather. Part of the gas will be purified and used to

run pumping engines and the rest will be sold to Neukoln or used to generate electricity."

Sacramento to Go Afar for Water. Anon. *Water Works Engineering*, vol. 81, No. 2, January 18, 1928, pp. 79–80 and 93. (Abstract by Frank Raab.)

At present the city of Sacramento, Calif., is taking its water supply from the Sacramento River which is filtered and chlorinated. At times when the water in the river is very low, it is so highly charged with organic matter that it is "undesirable as a public water supply." Likewise "during such low water stages the rise of the tide reverses the flow of the river and occasionally carries a portion of the sewage from the outlet of the city sewers back to and into the water works intake." Silver Creek has been proposed as a new supply. This creek has its source in the mountains at an elevation of more than 5,000 feet. The project would require the building of several dams at an estimated cost of about $29,000,000. It is estimated that completion of the project will yield from 160,000,000 to 190,000,000 gallons daily which would supply a city of about 1,000,000 population. The water would have to be carried over a distance of 60 miles. The article gives estimates of the cost of construction of the entire project as well as a part of it which is all that is deemed necessary at first. The article also suggests the feasibility of a hydroelectric project. It is planned that the present filter plant be retained as a stand-by plant.

Five Years' Operation of a Rapid Sand Filtration Plant. Melville C. Whipple and Harold C. Chandler. *The American City*, vol. 38, No. 2, February, 1928, pp. 119-120. (Abstract by W. L. Havens.)

In order to prevent corrosion of the Cambridge, Mass., water system, a policy has been followed of furnishing water as nearly like the untreated supply as possible in mineral constituents and no worse in its tendency to dissolve metals. This treatment has consisted of the addition of from 50 to 150 pounds per million gallons of soda ash when alum alone is used as the precipitant, and from 35 to 65 pounds when using both alum and sodium aluminate. Odors and growths in the fresh pond reservoir have been controlled by the dosage of copper sulphate in amounts equal to 2 pounds per million gallons. The *B. coli* index per 100 c. c. averaged, during 1926-27, 10.0, 0.6, 0.1, and 0 for the raw, coagulated, filtered, and effluent samples, respectively. The total purification costs, exclusive of fixed charges, have amounted to about $11.50 per million gallons during the past three years.

Sand Filter Plant, Launceston, Tasmania. G. D. Balsille. *The Commonwealth Engineer*, 15, 95 8 (1927). Abstract by Edward Bartow in *Chemical Abstracts*, vol. 22, No. 3, February 10, 1928, p. 471.

"The water is taken from St. Patrick's River and passed through a mortar-lined channel in which green algæ grow. The algæ are sometimes present in sufficient quantity to decrease the flow of water through the channel. It has been noted that these algæ grow at alkalinities below 17 parts per million, and disappear at alkalinities above 18. Caddis worms, larvæ of a fly of the dragon family, feed on and destroy the algæ. Fresh soda is used to raise the alkalinity when it is too low for efficient treatment on the sand filters. Color is the index to show practical operation and it has been reduced 90 per cent throughout the year."

The Biological Effect of Colored Glass Windows in Waterworks. R. Kilkwitz. Gas u. Wasserfach 70, 1118 (1927). Abstract by R. W. Ryan in *Chemical Abstracts*, vol. 22, No. 3, February 10, 1928, p. 471.

"The use of colored glass windows, especially green, results in a marked decrease in the formation of algæ and mosses on wooden parts and walls."

A Comparison of the Temperature and Bacterial Count of Milk and Foam During Certain Stages of the Pasteurization Process. H. A. Whittaker and R. W. Archibald, U. S. Department of Agriculture, Tech. Bulletin No. 18, September, 1927. 11 pages. (Abstract by C. T. Butterfield.)

This article includes a complete description of the apparatus and methods employed, including the construction, placement, and operation of the thermocouples. Studies were made under conditions of normal operation at plants using the batch method of Pasteurization.

Bacterial count of foam was higher in every instance than that of the milk. During Pasteurization the bacterial count of milk decreased, while in 66.7 per cent of the tests the count in the foam increased. Bacterial count of foam varied greatly at different points in vats. Depth of foam did not affect bacterial reduction. If vats are tightly closed, bacterial content of foam is reduced.

The temperature of the air above the foam and of the foam itself was in every instance lower than that of the milk. The amount of foam varied in area from small patches to the entire surface of the vat and in depth from one-half to 4 inches. In no case was the foam raised to a satisfactory Pasteurizing temperature.

Controle Technique d'une Installation Municipale de Stérilisation d'Eau par l'Ozone. **(Control of a Municipal Plant for Purification of Water by Ozone.)** J. Salmon and P. Quarre. *Bulletin of Hygiene*, vol. 2, No. 12, December, 1927, pp. 978–979 (Abstract by C. R. Cox.)

A description of the water disinfecting plant of the city of Boulogne consisting of an ozonizer and the circulating system for ozonized air and the sterilizer or disinfecting unit. The ozonizer consists of a series of glass cylinders, a coaxial aluminum rod which serves as one electrode, and the aluminum inclosing case which serves as the other electrode. A single phase, 50-cycle, alternating current transformed to 8,000 to 10,000 volts is applied to the electrodes. Air, dried by calcium chloride, is forced through the cylinders in which the silent electrical discharge occurs, generating the ozone. This ozonized air is forced through a sterilizer, consisting of a vertical tower of reinforced concrete divided at intervals by horizontal partitions of perforated celluloid to insure intimate contact between the water and the ozonized air, both of which enter at the base of the tower The effluent from the sterilizer is tested periodically with starch iodide for free ozone and in the manner used for determining the residual chlorine in water. Bacteriological data are given indicating that the number of *B. coli* per liter was reduced from 1,000 to 0 and the gelatin count was reduced from 714 to 6 per c. c. The plant, with a capacity of 10,000 gallons per hour, consumes 0.65 k. w. hours of current to operate the ozonizer, consisting of two units of 3 cylinders each, and an additional 1.1 k. w. hour to operate the air compressor.

The Lethal Effect of Various Chemicals on Cyclops and Daphnia. B. A. Adams. *Water Works Engineering* 29, 361–4 (1927). Abstract by J. A. Kennedy in *Chemical Abstracts*, vol. 22, No. 3, February 10, 1928, p. 473.

"All sterilizing agents used in water treatment are lethal to *Cyclops* and *Daphnia* in the water of the Nile. Cl and hypochlorite mixed with $(NH_4)_2SO_4$ is the most lethal and is effective in concentration of 1 in 1,000,000. Cl or hypochlorite alone is effective with a concentration of 1 in 500,000. $KMnO_4$, chloramine-T, and acridine are effective in concentrations of 1 in 200,000. Phenol and cresols are lethal in concentrations of 1 in 100,000. $CuSO_4$ has some effect, but formalin has no effect in a concentration of 1 in 100,000. Lime in excess or not quite in excess is very effective."

DEATHS DURING WEEK ENDED APRIL 7, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended April 7, 1928, and corresponding week of 1927. (From the Weekly Health Index, April 11, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Apr. 7, 1928	Corresponding week, 1927
Policies in force	70,570,508	67,271,091
Number of death claims	12,812	13,077
Death claims per 1,000 policies in force, annual rate	9.5	10.1

Deaths from all causes in certain large cities of the United States during the week ended April 7, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, April 11, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Apr. 7, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Apr. 7, 1928 [2]
	Total deaths	Death rate [1]		Week ended Apr. 7, 1928	Corresponding week, 1927	
Total (68 cities)	8,732	15.0	13.7	975	871	80
Akron	37			7	5	76
Albany [3]	42	18.2	16.6	8	4	164
Atlanta	62	12.8	15.1	3	8	
White	37		10.1	2	3	
Colored	25	(4)	26.8	1	5	
Baltimore [3]	254	16.0	15.5	38	28	121
White	176		13.3	28	20	112
Colored	78	(4)	28.6	10	8	157
Birmingham	80	18.8	17.5	10	13	86
White	30		12.6	3	4	41
Colored	50	(4)	25.2	7	9	158
Boston	269	17.6	16.6	45	30	124
Bridgeport	40			3	4	55
Buffalo	160	15.1	13.7	17	17	73
Cambridge	44	18.3	13.5	3	2	53
Camden	56	21.6	11.8	8	3	128
Canton	18	8.1	10.1	1	3	24
Chicago [3]	957	15.9	12.3	94	87	81
Cincinnati	171	21.6	16.6	14	14	85
Cleveland	241	12.5	10.9	15	28	41
Columbus	93	16.5	14.9	8	2	75
Dallas	60	14.4	13.8	9	8	
White	50		13.9	6	8	
Colored	10	(4)	13.3	3	0	
Dayton	48	13.6	15.6	3	2	50
Denver	92	16.4	17.5	8	8	
Des Moines	34	11.7	12.6	3	4	50
Detroit	375	14.2	10.9	79	50	122
Duluth	25	11.2	11.4	2	0	47
El Paso	50	22.2	17.0	8	9	
Erie	22			3	3	62
Fall River [3]	26	10.1	11.4	4	4	69
Flint	23	8.1	10.6	2	10	26
Fort Worth	39	12.1	14.0	3	3	
White	35		11.6	2	1	
Colored	4	(4)	31.9	1	2	
Grand Rapids	28	8.9	11.6	6	6	90
Houston	68			9	5	
White	50			8	4	
Colored	18	(4)		1	1	
Indianapolis	121	16.6	15.2	8	11	61
White	100		14.6	7	8	61
Colored	21	(4)	19.8	1	3	61
Jersey City	83	13.4	11.5	8	12	60
Kansas City, Kans	27	11.9	15.1	0	4	0
White	22		13.0	0	3	0
Colored	5	(4)	24.6	0	1	0
Kansas City, Mo	113	15.1	15.8	6	10	42

(See footnotes at end of table.)

Deaths from all causes in certain large cities of the United States during the week ended April 7, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, April 11, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Apr. 7, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Apr. 7, 1928
	Total deaths	Death rate		Week ended Apr. 7, 1928	Corresponding week, 1927	
Knoxville	32	15.9	19.9	5	5	109
White	25	------	18.0	4	5	97
Colored	7	(4)	34.2	1	0	213
Los Angeles	277	------	------	17	16	49
Louisville	110	17.5	15.5	11	3	92
White	90	------	14.4	10	3	95
Colored	20	(4)	21.3	1	0	69
Lowell	27	12.8	15.6	1	5	21
Lynn	16	7.9	10.9	1	4	25
Memphis	70	19.2	19.5	2	4	23
White	35	------	16.3	1	2	19
Colored	35	(4)	25.5	1	2	31
Milwaukee	131	12.6	9.7	22	18	98
Minneapolis	103	11.8	12.5	12	9	72
Nashville	64	24.1	18.2	7	6	110
White	40	------	14.8	2	3	43
Colored	24	(4)	26.8	5	3	300
New Bedford	30	13.1	10.9	4	3	87
New Haven	42	11.7	14.4	9	3	127
New Orleans	156	19.0	18.8	13	26	63
White	90	------	13.3	6	13	44
Colored	66	(4)	34.5	7	13	102
New York	1,862	16.2	14.2	216	175	87
Bronx Borough	230	12.6	11.8	15	19	45
Brooklyn Borough	618	14.0	12.4	90	68	90
Manhattan Borough	766	22.9	19.2	81	73	96
Queens Borough	200	12.2	9.9	21	13	85
Richmond Borough	48	16.7	17.1	9	2	162
Newark, N. J	116	12.8	12.7	20	11	103
Oklahoma City	30	------	------	3	4	------
Omaha	54	12.7	19.3	7	10	81
Paterson	33	11.9	9.4	5	2	87
Philadelphia	501	15.0	14.7	53	53	71
Pittsburgh	210	16.3	15.7	25	28	82
Portland, Oreg	75	------	------	8	5	86
Providence	88	16.1	12.6	7	6	61
Richmond	50	13.4	15.2	6	7	78
White	32	------	12.6	4	4	81
Colored	18	(4)	21.6	2	3	73
Rochester	85	13.5	13.0	9	6	73
St. Louis	232	14.3	14.2	22	9	74
St. Paul	65	13.5	12.7	3	6	29
Salt Lake City [3]	25	9.5	13.4	3	2	49
San Antonio	70	16.8	15.5	16	8	------
San Diego	37	16.2	14.5	0	2	0
San Francisco	144	12.9	14.7	5	5	31
Schenectady	23	12.9	11.7	3	3	94
Seattle	73	10.0	10.3	3	1	31
Somerville	26	13.2	9.2	6	4	207
Spokane	29	13.9	12.4	3	0	77
Springfield, Mass	30	10.5	11.0	4	6	63
Syracuse	58	15.2	13.2	6	6	73
Toledo	88	14.7	13.7	7	4	67
Trenton	39	14.7	14.1	6	7	102
Utica	31	15.6	15.1	2	2	45
Washington, D. C	137	13.0	12.4	15	16	86
White	83	------	9.8	11	10	91
Colored	54	(4)	19.9	4	6	74
Waterbury	21	------	------	0	3	0
Wilmington, Del	28	11.4	6.6	5	3	132
Worcester	74	19.6	16.0	8	7	97
Yonkers	27	11.6	11.4	3	5	68
Youngstown	35	10.5	10.2	7	11	93

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, Apr. 6, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended April 16, 1927, and April 14, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 16, 1927, and April 14, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928
New England States:								
Maine	4	7	68	1	113	42	0	0
New Hampshire		1						0
Vermont		1			117	40	0	0
Massachusetts	97	90	16	25	368	1,573	2	2
Rhode Island	1	15				236	0	0
Connecticut	21	23	6	13	77	369	1	0
Middle Atlantic States:								
New York	495	363	[1] 43	[1] 117	793	2,723	9	37
New Jersey	113	113	21	23	78	1,582	1	3
Pennsylvania	168	169			854	1,885	2	9
East North Central States.								
Ohio		142		84		1,034		6
Indiana	31	21	27	18	200	435	0	0
Illinois	108	103	27	219	1,991	164	3	11
Michigan	93	49		16	194	1,472	0	0
Wisconsin	29	22	52	412	833	101	6	9
West North Central States:								
Minnesota	21	17	6	44	176	93	2	4
Iowa	25	9			462	31	1	1
Missouri	37	27	5	52	231	89	2	4
North Dakota	10	5		44	109	15	1	1
South Dakota	6	5	10	16	254	45	1	3
Nebraska	5	6	16	63	301	30	0	1
Kansas	9	2	4	7	1,147	78	2	2
South Atlantic States:								
Delaware					19	27	0	0
Maryland [2]	40	31	55	26	37	1,074	0	0
District of Columbia	30		2		3		0	
Virginia								
West Virginia	17	15	47	13	151	228	0	0
North Carolina	23	22			920	1,959	0	0
South Carolina	18	17	1,776	657	177	553	0	0
Georgia	12	11	180	106	145	134	3	0
Florida	33	16	5	40	192	81	1	0
East South Central States:								
Kentucky				21		321		0
Tennessee	10	6	195	199	92	250	2	1
Alabama	22	15		286	197	408	0	1
Mississippi	5							

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 16, 1927, and April 14, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928
West South Central States:								
Arkansas	2	2	42	256	208	426	0	1
Louisiana	27	32	7	35	100	116	1	0
Oklahoma [3]	18	29	159	437	336	349	1	3
Texas	39	28	35	141	387	267	1	2
Mountain States:								
Montana	6	16			54	6	4	1
Idaho	4				74	9	2	3
Wyoming				1	83	21	0	3
Colorado	8	13	1	2	177	86	0	2
New Mexico	3	1			122	107	0	0
Arizona	4	14	3		153	34	0	2
Utah [2]	7	3		3	66	4	0	1
Pacific States:								
Washington	14	11		1	431	183	5	1
Oregon	13	14	53	34	217	68	1	2
California	101	78	13	52	2,474	118	6	2

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928
New England States:								
Maine	0	0	17	22	0	0	2	0
New Hampshire		0		7		0		0
Vermont	0	0	8	1	0	0	0	1
Massachusetts	1	0	494	294	0	0	7	4
Rhode Island	1	0	18	28	0	0	1	0
Connecticut	0	0	85	57	0	0	1	3
Middle Atlantic States:								
New York	2	1	1,156	724	7	3	13	15
New Jersey	1	0	306	285	0	3	4	3
Pennsylvania	0	1	654	578	0	2	17	6
East North Central States:								
Ohio		4		206		34		8
Indiana	0	0	193	111	232	138	5	1
Illinois	1	1	288	236	30	23	8	5
Michigan	0	0	256	237	19	45	6	6
Wisconsin	1	3	188	183	7	7	4	2
West North Central States:								
Minnesota	0	1	175	145	4	2	4	2
Iowa	0	0	38	51	21	57	1	1
Missouri	1	0	96	71	36	57	3	1
North Dakota	1	2	64	70	3	4	2	3
South Dakota	0	0	68	36	1	4	1	4
Nebraska	0	0	58	145	33	38	1	1
Kansas	0	0	105	159	9	60	2	2
South Atlantic States:								
Delaware	0	0	12	3	0	1	0	0
Maryland [2]	0	0	73	78	0	0	9	12
District of Columbia	0		12		0		0	
Virginia	0				15			
West Virginia	0	0	58	48	40	54	4	6
North Carolina	0	0	14	24	33	58	1	3
South Carolina	1	0	10	7	18	12	3	11
Georgia	0	0	8	12	41	0	14	3
Florida	0	1	24	21	50	6	22	9
East South Central States:								
Kentucky		0		44		17		9
Tennessee	0	0	30	18	8	12	5	4
Alabama	0	2	9	8	51	11	21	6
Mississippi	0		5		7		12	
West South Central States:								
Arkansas	0	0	2	12	2	13	2	2
Louisiana	0	0	6	7	3	20	17	12
Oklahoma [3]	0	1	70	79	28	186	47	6
Texas	0	0	10	65	75	24	12	5

[2] Week ended Friday.
[3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 16, 1927, and April 14, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928	Week ended Apr. 16, 1927	Week ended Apr. 14, 1928
Mountain States:								
Montana	0	0	63	21	12	25	1	0
Idaho	0	0	13	6	0	5	1	5
Wyoming	0	0	16	28	8	3	0	0
Colorado	0	0	143	94	10	9	1	1
New Mexico	0	1	16	33	1	3	0	0
Arizona	1	0	50	5	4	43	1	0
Utah [2]	0	0	32	4	3	15	0	0
Pacific States:								
Washington	1	0	64	27	33	36	10	5
Oregon	0	0	12	6	15	47	4	2
California	1	5	183	114	28	28	9	4

[2] Week ended Friday.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January, 1928										
Colorado	25	82	3		353		8	594	102	10
February, 1928										
Colorado	21	70	15		240		1	509	60	4
District of Columbia	0	134	9		249		0	193	0	1
March, 1928										
Arizona	21	29	3		109		1	89	132	8
Connecticut	4	108	199		1,574		2	453	4	3
Nebraska	5	52	257		137		4	582	255	1
North Dakota	12	22	12		15		1	309	6	10
Vermont	0	3			325			60	0	1

January, 1928

	Cases
Colorado:	
Botulism (December)	3
Chicken pox	474
German measles	16
Impetigo contagiosa	5
Mumps	248
Scabies	4
Trachoma	2
Whooping cough	82

February, 1928

	Cases
Chicken pox:	
Colorado	227
District of Columbia	97
German measles:	
Colorado	6
Impetigo contagiosa:	
Colorado	14
Mumps:	
Colorado	59
Paratyphoid fever:	
Colorado	1

February, 1928—Continued

	Cases
Puerperal fever:	
Colorado	1
Scabies:	
Colorado	7
Septic sore throat:	
Colorado	2
Trachoma:	
Colorado	1
Whooping cough:	
Colorado	99
District of Columbia	34

March, 1928

	Cases
Chicken pox:	
Arizona	58
Connecticut	417
Nebraska	330
North Dakota	66
Vermont	170

March, 1928—Continued

	Cases
Conjunctivitis:	
Connecticut	2
Dysentery (bacillary):	
Connecticut	1
German measles:	
Connecticut	11
North Dakota	4
Impetigo contagiosa:	
North Dakota	5
Lead poisoning:	
Connecticut	1
Lethargic encephalitis:	
Connecticut	2
North Dakota	7
Mumps:	
Arizona	56
Connecticut	1,269
Nebraska	437
North Dakota	94
Vermont	448

March, 1928—Continued

	Cases
Paratyphoid fever:	
Arizona	1
Rabies (in animals):	
Connecticut	1
Septic sore throat:	
Connecticut	5
Nebraska	17
Vermont	14
Tetanus:	
Connecticut	1
Trachoma:	
Arizona	21
Trichinosis:	
Connecticut	4
Vincent's angina:	
North Dakota	1
Whooping cough:	
Arizona	23
Connecticut	572
Nebraska	59
North Dakota	46
Vermont	141

Number of Cases of Certain Communicable Diseases Reported for the Month of January, 1928, by State Health Officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	161	13	248	80	141	0	34	11	74
New Hampshire		1			83	0		0	
Vermont	256	5	74	198	54	0	13	1	64
Massachusetts	1,320	485	5,518	1,311	1,508	3	473	28	1,271
Rhode Island	48	95	37	60	214	0	33	5	19
Connecticut	582	177	606	390	496	125	144	5	516
New York	2,507	1,835	4,607	2,286	2,857	44	1,719	92	2,125
New Jersey	1,006	761	1,051		987	4	419	27	723
Pennsylvania	3,339	1,123	3,963	2,932	2,348	0	630	80	1,144
Ohio	1,746	705	2,163	1,375	1,452	98	441	54	702
Indiana	236	188	318	74	406	471	140	17	66
Illinois	1,758	761	234	1,171	1,515	121	984	57	1,101
Michigan	770	375	1,550	1,092	1,125	169	404	22	596
Wisconsin	1,175	149	276	828	772	130	128	8	293
Minnesota	412	153	28		707	11	180	18	55
Iowa	224	85	284	168	368	350	21	11	42
Missouri	279	197	252	635	401	215	205	15	208
North Dakota	73	23	45	19	140	14	[1] 3	5	18
South Dakota	70	9	138	97	294	67	5	1	39
Nebraska	274	49	37	125	322	161	16	6	47
Kansas	893	100	110	207	775	470	131	5	431
Delaware	46	10	64	41	16	0	[1] 4	0	15
Maryland	712	131	1,358	118	285	2	218	27	133
District of Columbia	137	140	38		153	0	86	2	43
Virginia	628	194	1,755		281	34	[1] 57	37	469
West Virginia	241	75	345		243	88	33	26	141
North Carolina	775	270	13,760		282	501		9	544
South Carolina	248	135	4,075	8	67	76	161	31	244
Georgia	115	56	513	85	70	32	63	30	31
Florida	172	67	29	19	45	19	61	30	6
Kentucky [4]									
Tennessee	208	91	2,994	114	95	93	149	37	135
Alabama	180	163	806	156	73	24	195	43	97
Mississippi	802	101	5,174	1,100	143	132	290	50	1,401
Arkansas	291	63	1,097	249	129	65	[1] 38	30	80
Louisiana	47	104	406	31	51	68	[1] 132	33	24
Oklahoma [3]	141	155	464	73	160	512	53	38	22
Texas [2]									
Montana	76	25	6	3	141	135	32	3	31
Idaho	109	2	10	103	126	80	[1] 8	3	6
Wyoming	63	5	10	9	136	30		1	76
Colorado	471	82	353	248	594	102	133	10	82
New Mexico [2]									
Arizona	51	60	64	17	24	9	94	7	24
Utah [2]									
Nevada [1]									
Washington	374	70	247	326	299	228	98	13	41
Oregon	298	48	168	80	88	193	47	13	29
California	1,906	581	367	623	845	109	758	35	516

[1] Pulmonary.
[2] Reports received weekly.
[3] Exclusive of Oklahoma City and Tulsa.
[4] Reports received annually.

Case Rates per 1,000 Population (Annual Basis) for the Month of January, 1928

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	2.39	0.19	3.68	1.19	2.09	0.00	0.50	0.16	1.10
New Hampshire		.03			2.15				
Vermont	8.58	.17	2.48	6.63	1.81	.00	.44	.03	2.14
Massachusetts	3.63	1.83	15.19	3.61	4.15	.01	1.30	.08	3.50
Rhode Island	.79	1.57	.61	.99	3.53	.00	.54	.08	.31
Connecticut	4.12	1.25	4.29	2.76	3.51	.89	1.02	.04	3.65
New York	2.56	1.88	4.71	2.34	2.92	.04	1.76	.09	2.17
New Jersey	3.11	2.35	3.25		3.05	.01	1.36	.08	2.23
Pennsylvania	4.00	1.35	4.75	3.51	2.81	.00	.75	.10	1.37
Ohio	3.02	1.22	3.74	2.38	2.51	.17	.76	.09	1.21
Indiana	.88	.70	1.18	.28	1.73	1.75	.52	.06	.25
Illinois	2.80	1.21	.37	1.87	2.42	.19	1.57	.09	1.76
Michigan	1.98	.96	3.99	2.81	2.89	.43	1.04	.06	1.53
Wisconsin	4.70	.60	1.10	3.31	3.09	.52	.51	.03	1.17
Minnesota	1.79	.66	.12		3.07	.05	.78	.08	.24
Iowa	1.09	.41	1.38	.82	1.79	1.75	.10	.05	.20
Missouri	.93	.66	.84	2.13	1.34	.72	.69	.05	.70
North Dakota	1.34	.42	.83	.35	2.58	.26	[1].06	.09	.33
South Dakota	1.17	.15	2.31	1.63	4.93	1.12	.08	.02	.65
Nebraska	2.30	.41	.31	1.05	2.70	1.35	.13	.05	.39
Kansas	5.75	.64	.71	1.33	4.99	3.02	.84	.03	2.77
Delaware	2.23	.48	3.10	1.98	.77	.00	[1].19	.00	.73
Maryland	5.20	.96	9.92	.86	2.08	.01	1.59	.20	.97
District of Columbia	2.93	2.99	.81		3.27	.00	1.84	.04	.92
Virginia	2.88	.89	8.05		1.29	.16	[1].26	.17	2.15
West Virginia	1.65	.51	2.36		1.66	.00	.23	.18	.97
North Carolina	3.11	1.09	55.30		1.13	2.01		.04	2.19
South Carolina	1.57	.86	25.81	.05	.42	.48	1.02	.20	1.55
Georgia	.42	.21	1.89	.31	.26	.12	.23	.11	.11
Florida	1.44	.56	.24	.16	.38	.16	.51	.25	.05
Kentucky [2]									
Tennessee	.98	.43	14.13	.54	.45	.46	.70	.17	.64
Alabama	.83	.75	3.70	.72	.33	.11	.89	.20	.45
Mississippi	5.20	.67	34.12	7.25	.94	.87	1.91	.33	9.24
Arkansas	1.77	.38	6.06	1.51	.78	.39	[1].23	.18	.49
Louisiana	.28	.63	2.46	.19	.31	.41	[1].80	.20	.15
Oklahoma [3]	.78	.85	2.55	.40	.88	2.82	.29	.21	.12
Texas [2]									
Montana	1.63	.54	.13	.06	3.03	2.90	.69	.06	.67
Idaho	2.36	.04	.22	2.23	2.72	1.73	[1].17	.06	.13
Wyoming	3.01	.24	.91	.43	6.50	1.43		.05	3.63
Colorado	5.13	.89	3.82	2.69	6.43	1.10	1.44	.11	.89
New Mexico [2]									
Arizona	1.27	1.49	1.59	.42	.60	.22	2.34	.17	.60
Utah [2]									
Nevada [1]									
Washington	2.78	.52	1.84	2.43	2.22	1.70	.73	.10	.30
Oregon	3.90	.63	2.20	1.05	1.15	2.53	.62	.17	.26
California	5.17	1.51	.95	1.01	2.19	.28	1.96	.09	1.34

[1] Pulmonary.
[2] Reports received weekly.
[3] Exclusive of Oklahoma City and Tulsa.
[4] Reports received annually.

Number of Cases of Certain Communicable Diseases Reported for the Month of February, 1928, by State Health Officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	119	20	169	141	122	0	20	8	132
New Hampshire		8			88	0		0	
Vermont	193	3	104	144	59	0	[1] 10	1	79
Massachusetts	1,092	496	7,174	1,325	1,400	0	508	15	1,079
Rhode Island	44	67	176	143	264	0	28	5	28
Connecticut	404	138	1,267	541	378	16	160	7	642
New York	2,372	1,714	6,824	3,004	3,330	42	1,519	68	2,019
New Jersey	896	595	2,415		1,197	1	418	13	631
Pennsylvania	3,121	1,001	5,363	4,257	2,557	1	761	50	1,361
Ohio	1,500	587	3,715	1,843	1,512	122	623	80	728
Indiana	273	141	533	215	577	471	112	11	82
Illinois	1,745	706	489	1,380	1,459	206	1,111	45	1,239
Michigan	719	301	2,586	1,775	1,297	139	538	31	666
Wisconsin	920	142	329	914	803	109	177	11	386
Minnesota	416	123	42		708	12	282	9	101
Iowa	310	66	193	218	410	295	25	9	40
Missouri	293	228	565	820	468	190	191	11	268
North Dakota	55	26	26	50	257	16	8	6	14
South Dakota [2]									
Nebraska	343	61	16	275	391	132	14	7	75
Kansas	702	77	181	420	813	302	133	3	365
Delaware	24	6	37	41	18	0	[1] 9	1	21
Maryland	565	164	2,921	133	293	1	190	15	192
District of Columbia	97	134	249		193	0	84	1	84
Virginia	737	122	3,905		293	20	[1] 143	27	544
West Virginia	186	86	423		226	251	61	44	74
North Carolina	693	183	17,433		177	408		12	679
South Carolina	247	315	5,276	9	40	33	151	26	308
Georgia	21	44	758	81	86	20	72	29	57
Florida	317	58	66	49	53	19	38	20	38
Kentucky [3]									
Tennessee	135	76	2,208	425	152	115	198	31	80
Alabama	167	119	1,033	92	49	23	808	39	69
Mississippi	885	75	6,382	1,322	95	134	300	47	1,503
Arkansas	171	45	2,396	232	147	31	50	22	101
Louisiana	38	86	874	19	44	99	116	43	30
Oklahoma [4]	174	114	721	73	260	589	72	43	42
Texas									
Montana	72	46	9	8	97	78	30	0	12
Idaho	58	5		151	52	36	[1] 4	1	10
Wyoming	26	7	173	17	100	16	1	1	37
Colorado	227	70	240	59	509	60	131	4	99
New Mexico [3]									
Arizona	82	42	40	44	25	101	72	2	19
Utah [3]									
Nevada [5]									
Washington	420	60	1,219	349	278	265	192	11	69
Oregon	258	46	267	88	114	184	58	11	21
California	2,876	641	864	1,329	1,109	191	1,007	50	738

[1] Pulmonary.
[2] Reports not received at time of going to press.
[3] Reports received weekly.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Reports received annually.

Case Rates per 1,000 Population (Annual Basis) for the Month of February, 1928

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	1.89	0.32	2.68	2.24	1.94	0.00	0.32	0.13	2.10
New Hampshire	.09	.22			2.44	.00		.00	
Vermont	6.91	.11	3.72	5.16	2.11	.00	[1] .39	.04	2.83
Massachusetts	3.21	1.46	21.11	3.90	4.12	.00	1.49	.04	3.17
Rhode Island	.78	1.18	3.10	2.52	4.65	.00	.49	.09	.49
Connecticut	3.06	1.04	9.59	4.10	2.86	.12	1.21	.05	4.86
New York	2.59	1.87	7.46	3.28	3.64	.05	1.66	.07	2.21
New Jersey	2.96	1.97	7.98		3.95	.00	1.38	.04	2.08
Pennsylvania	4.00	1.28	6.87	5.45	3.28	.00	.97	.06	1.74
Ohio	2.77	1.09	6.87	3.41	2.80	.23	1.15	.06	1.34
Indiana	1.08	.56	2.12	.85	2.29	1.87	.45	.04	.33
Illinois	2.98	1.20	.83	2.35	2.49	.35	1.90	.08	2.11
Michigan	1.93	.83	7.11	4.88	3.57	.38	1.48	.09	1.83
Wisconsin	3.93	.61	1.41	3.91	3.43	.47	.76	.05	1.65
Minnesota	1.93	.57	.19		3.28	.06	1.31	.04	.47
Iowa	1.61	.34	1.00	1.18	2.16	1.53	.13	.05	.21
Missouri	1.05	.82	2.02	2.94	1.68	.68	.08	.04	.96
North Dakota	1.08	.51	.51	.98	5.06	.31	.16	.12	.28
South Dakota [2]									
Nebraska	3.07	.55	.14	2.47	3.50	1.18	.13	.06	.07
Kansas	4.83	.53	1.24	2.89	5.59	2.08	.91	.02	2.51
Delaware	1.24	.31	1.91	2.12	.93	.00	[1] .47	.03	1.09
Maryland	4.41	1.28	22.81	1.04	2.29	.01	1.48	.12	1.50
District of Columbia	2.22	3.06	5.69		4.41	.00	1.92	.02	.78
Virginia	3.61	.60	19.14		1.44	.10	[1] .70	.13	2.67
West Virginia	1.36	.63	3.10		1.65	1.84	.45	.32	.54
North Carolina	2.98	.79	74.89		.76	2.14		.05	2.92
South Carolina	1.67	2.13	35.72	.06	.27	.22	1.02	.18	2.09
Georgia	.08	.17	2.99	.32	.31	.08	.28	.11	.22
Florida	2.84	.52	.59	.44	.47	.17	.34	.18	.31
Kentucky [3]									
Tennessee	.68	.38	11.59	2.14	.77	.58	1.00	.16	.40
Alabama	.82	.58	5.07	.45	.24	.11	1.51	.19	.34
Mississippi	6.24	.53	44.98	9.32	.67	.94	2.11	.33	11.62
Arkansas	1.11	.29	15.55	1.51	.95	.20	.32	.14	.66
Louisiana	.25	.56	5.66	.12	.28	.64	.75	.28	.19
Oklahoma [4]	1.02	.67	4.24	.43	1.53	3.46	.42	.25	.25
Texas									
Montana	1.66	1.06	.21	.18	3.23	1.79	.69	.00	.28
Idaho	1.34	.12		3.49	1.20	.83	[1] .09	.02	.23
Wyoming	1.33	.36	8.84	.87	5.11	.82	.05	.05	1.89
Colorado	2.63	.81	2.78	.68	5.89	.60	1.52	.05	1.15
New Mexico [3]									
Arizona	2.18	1.12	1.07	1.17	.67	2.69	1.92	.05	.51
Utah [3]									
Nevada [5]									
Washington	3.34	.48	9.69	2.78	2.21	2.11	1.53	.09	.55
Oregon	3.61	.64	3.74	1.23	1.60	2.57	.81	.15	.20
California	7.97	1.78	2.39	3.68	3.07	.53	2.79	.14	2.04

[1] Pulmonary.
[2] Reports not received at time of going to press.
[3] Reports received weekly.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Reports received annually.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 99 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,500,000. The estimated population of the 93 cities reporting deaths is more than 30,800,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended March 31, 1928, and April 2, 1927

	1928	1927	Estimated expectancy		1928	1927	Estimated expectancy
Cases reported				*Cases reported*—Contd.			
Diphtheria:				Typhoid fever:			
43 States	1,554	1,824		43 States	170	227	
99 cities	840	1,130	900	99 cities	33	47	37
Measles.				*Deaths reported*			
41 States	18,788	16,191					
99 cities	8,378	4,807		Influenza and pneumonia:			
Poliomyelitis				93 cities	1,476	1,077	
43 States	28	14		Smallpox			
Scarlet fever.				93 cities	0	0	
42 States	4,887	6,143					
99 cities	1,831	2,611	1,367				
Smallpox.							
43 States	1,205	1,064					
99 cities	150	143	120				

City reports for week ended March 31, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
NEW ENGLAND									
Maine:									
Portland	76,400	3	0	1	0	0	0	17	1
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	2
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	31	42	23	6	2	472	11	43
Fall River	131,000	0	3	1	1	1	1	0	2
Springfield	145,000	8	3	0	0	0	0	33	2
Worcester	193,000	20	4	3	0	0	50	48	12
Rhode Island:									
Pawtucket	71,000	3	1	1	0	0	8	17	0
Providence	275,000	11	8	10	0	0	165	11	12
Connecticut:									
Bridgeport	([2])	3	6	5	3	0	0	0	4
Hartford	164,000	0	7	4	2	2	21	7	7
New Haven	182,000	14	3	0	0	0	159	79	13

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended March 31, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	11	10	19	5	0	198	49	24
New York	5,924,000	225	240	258	67	31	1,476	54	330
Rochester	321,000	7	11	3	2	0	36	31	7
Syracuse	185,000	40	5	0	--------	0	120	9	2
New Jersey:									
Camden	131,000	1	6	3	1	1	93	0	8
Newark	459,000	22	12	19	19	0	439	25	19
Trenton	134,000	1	4	4	3	1	11	0	6
Pennsylvania:									
Philadelphia	2,008,000	63	71	52	4	20	527	92	96
Pittsburgh	637,000	30	18	10	--------	6	152	91	48
Reading	114,000	8	2	3	--------	1	8	2	2
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	6	8	12	0	3	122	0	29
Cleveland	960,000	53	27	43	35	4	34	141	27
Columbus	285,000	6	4	2	1	1	33	9	6
Toledo	295,000	36	4	5	0	0	286	13	3
Indiana:									
Fort Wayne	99,900	2	2	4	0	0	2	0	4
Indianapolis	367,000	15	6	5	0	0	60	160	36
South Bend	81,700	0	1	0	0	0	1	0	4
Terre Haute	71,900	5	1	0	0	2	0	0	3
Illinois:									
Chicago	3,048,000	104	75	105	95	14	27	49	130
Springfield	64,700	7	1	0	4	4	0	13	5
Michigan:									
Detroit	1,290,000	62	53	36	7	5	1,182	59	56
Flint	136,000	11	4	2	0	0	50	138	1
Grand Rapids	156,000	6	2	0	1	2	42	22	1
Wisconsin:									
Kenosha	52,700	37	1	0	0	0	2	0	3
Milwaukee	517,000	70	16	10	2	2	8	42	10
Racine	69,400	5	2	4	0	0	0	6	1
Superior	[1] 39,671	1	1	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	3	0	0	0	0	0	6	1
Minneapolis	434,000	61	14	12	0	1	108	214	11
St. Paul	248,000	20	12	0	0	0	2	63	4
Iowa:									
Davenport	[1] 52,469	3	0	0	0	--------	1	0	--------
Des Moines	146,000	0	2	1	0	--------	0	0	--------
Sioux City	78,000	2	1	0	0	--------	6	40	--------
Waterloo	36,900	5	0	0	0	--------	0	6	--------
Missouri:									
Kansas City	375,000	40	6	4	0	5	32	143	18
St. Joseph	78,400	3	1	0	0	0	0	4	4
St. Louis	830,000	22	38	23	2	1	233	11	--------
North Dakota:									
Fargo	[1] 26,403	--------	0	--------	--------	--------	--------	--------	--------
Grand Forks	[1] 14,811	1	0	1	0	--------	0	0	--------
South Dakota:									
Aberdeen	[1] 15,036	18	0	0	0	--------	0	0	--------
Sioux Falls	[1] 30,127	0	0	0	0	--------	0	0	--------
Nebraska:									
Omaha	216,000	14	2	4	0	0	2	0	13
Kansas:									
Topeka	56,500	37	1	0	5	2	1	6	6
Wichita	92,500	17	2	0	0	0	0	0	7

[1] Estimated, July 1, 1925.

City reports for week ended March 31, 1928—**Continued**

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	2	2	3	0	0	5	0	2
Maryland:									
Baltimore	808,000	93	28	19	18	3	847	19	44
Cumberland	[1] 33,741	2	1	0	0	0	4	0	3
Frederick	[1] 12,035	1	0	0	0	0	3	0	0
District of Columbia:									
Washington	528,000	26	12	22	1	1	229	0	15
Virginia:									
Lynchburg	30,500	0	0	1	0	0	30	0	3
Norfolk	174,000	18	1	2	0	0	84	0	6
Richmond	189,000	11	2	3	0	1	201	2	7
Roanoke	61,900	0	0	7	0	1	25	2	3
West Virginia:									
Charleston	50,700	0	1	0	0	1	0	1	1
Wheeling	[1] 56,208	6	1	0	0	0	1	0	2
North Carolina:									
Raleigh	[1] 30,371	2	0	2	0	0	93	0	2
Wilmington	37,700	2	0	2	0	2	5	0	8
Winston-Salem	71,800	9	0	1	0	0	45	17	3
South Carolina:									
Charleston	74,100	1	0	0	18	1	3	0	7
Columbia	41,800	12	0	0	0	0	14	26	3
Greenville	[1] 27,311	0	0	0	0	0	1	3	0
Georgia:									
Atlanta	([2])	12	2	6	17	1	32	16	12
Brunswick	[1] 16,869	3	0	0	0	0	28	6	1
Savannah	94,900	5	1	0	16	1	6	0	7
Florida:									
Miami	[1] (9,754	26	5	1	0	0	2	14	2
St. Petersburg	[1] 26,847	----	0	-----	---	0	--	-----	0
Tampa	102,000	9	1	1	0	0	1	0	2
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	1	0	0	0	1	10	0	4
Louisville	311,000	3	3	7	9	0	147	6	34
Tennessee:									
Memphis	177,000	13	4	7	0	5	39	14	4
Nashville	137,000	8	0	1	0	2	25	5	8
Alabama:									
Birmingham	211,000	16	2	1	21	3	112	5	3
Mobile	66,800	0	1	1	1	4	2	0	2
Montgomery	47,000	12	0	0	1	--------	5	1	-------
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	2	0	0	0	--------	0	0	--------
Little Rock	75,900	1	1	0	1	0	27	0	8
Louisiana:									
New Orleans	419,000	9	7	10	10	3	4	0	12
Shreveport	59,500	3	0	0	0	0	84	1	5
Oklahoma:									
Oklahoma City	([2])	0	1	4	25	0	27	4	7
Texas:									
Dallas	203,000	19	4	6	12	10	13	0	8
Fort Worth	159,000	25	2	3	3	3	7	3	12
Galveston	49,100	2	0	1	0	0	5	0	1
Houston	[1] 164,954	1	2	5	0	1	53	1	15
San Antonio	205,000	2	1	5	0	7	23	0	10
MOUNTAIN									
Montana:									
Billings	[1] 17,971	1	0	2	0	0	0	0	0
Great Falls	[1] 29,883	10	0	0	0	0	0	0	2
Helena	[1] 12,037	0	0	0	0	0	0	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	1	0	0	0	0	1	0	0

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended March 31, 1928—Continued

Division, State and city	Population, July 1, 1926, estimated	Chicken pox cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps cases reported	Pneumonia, deaths reported
MOUNTAIN—continued									
Colorado									
Denver	285 000	8	9	10		6	68	139	4
Pueblo	43 900	9	1	0	0	0	11	0	1
New Mexico									
Albuquerque	[1] 21 000	1	0	0	0	0	19	0	3
Utah									
Salt Lake City	133 000	18	3	1	0	0	5	0	5
Nevada									
Reno	[1] 12 65[illegible]	0	0	0	0	0	0	0	0
PACIFIC									
Washington									
Seattle	([2])	19	5	1	0		135	7	-
Spokane	10[illegible] 000	8	2	0	0		1	0	
Tacoma	10[illegible] 000		1	-					
Oregon									
Portland	[1] 282 383	25	7	0	0	0	13	2	5
California									
Los Angeles	([2])	129	44	17	16	2	18	60	20
Sacramento	[illegible] 400	14	1	0	0	0	10	3	2
San Francisco	[illegible] 000	73	21	11	4	2	40	68	8

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough cases reported	Deaths, all causes
NEW ENGLAND											
Maine											
Portland	4	1	0	0	0	2	0	0	0	5	35
New Hampshire											
Concord	1	0	0	0	0	0	0	0	0	0	7
Vermont											
Barre	0	0	0	0	0	1	0	0	0	0	3
Massachusetts											
Boston	77	78	0	0	0	15	1	1	0	63	268
Fall River	4	15	0	0	0	1	1	1	0	1	22
Springfield	5	20	0	0	0	1	0	0	0	4	39
Worcester	11	9	0	0	0	2	0	0	0	13	77
Rhode Island											
Pawtucket	2	1	0	0	0	0	0	0	0	2	26
Providence	9	40	0	0	0	4	0	0	0	2	78
Connecticut											
Bridgeport	12	2	0	0	0	0	0	0	0	4	40
Hartford	6	7	0	0	0	2	1	0	0	5	41
New Haven	11	3	0	0	0	2	1	0	0	11	50
MIDDLE ATLANTIC											
New York											
Buffalo	21	59	0	0	0	12	0	0	1	23	145
New York	287	503	1	1	0	134	8	8	0	151	1,770
Rochester	16	6	0	0	0	1	0	0	0	[illegible]	66
Syracuse	13	10	0	0	0	3	0	0	0	24	45
New Jersey											
Camden	6	6	1	0	0	0	0	0	0	1	44
Newark	32	51	0	0	0	6	0	0	0	30	124
Trenton	5	3	0	0	0	4	0	0	0	0	43
Pennsylvania											
Philadelphia	90	120	0	0	0	38	3	1	0	67	640
Pittsburgh	30	32	1	0	0	9	1	0	0	32	-
Reading	4	21	0	0	0	0	0	0	0	1	22

[1] Estimated, July 1 1925

[2] No estimate made

City reports for week ended March 31, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
EAST NORTH CENTRAL											
Ohio											
Cincinnati	19	20	1	2	0	14	0	0	0	5	166
Cleveland	40	[illegible]	1	0	0	15	1	0	0	47	220
Columbus	12	9	2	0	0	12	0	0	0	0	106
Toledo	15	7	3	0	0	0	0	0	0	5	58
Indiana											
Fort Wayne	[illegible]	12	3	0	0	0	0	0	0	0	25
Indianapolis	9	15	9	11	0	4	0	1	0	2	102
South Bend	4	1	1	0	0	0	0	0	0	2	15
Terre Haute	3	1	1	5	0	1	0	0	0	0	24
Illinois											
Chicago	126	135	2	3	0	56	2	2	0	102	915
Springfield	[illegible]	16	0	8	0	0	0	0	0	1	35
Michigan											
Detroit	95	102	2	2	0	27	1	0	0	71	384
Flint	7	11	1	2	0	1	0	0	0	8	24
Grand Rapids	9	[illegible]	0	0	0	0	0	0	0	4	34
Wisconsin											
Kenosha	3	1	1	4	0	1	0	0	0	8	14
Milwaukee	27	45	2	0	0	11	0	0	0	14	125
Racine	4	3	0	0	0	0	0	0	0	5	8
Superior	3	6	1	0	0	0	0	0	0	0	5
WEST NORTH CENTRAL											
Minnesota											
Duluth	9	11	0	0	0	3	0	0	0	[illegible]	24
Minneapolis	[illegible]	31	5	1	0	3	0	0	0	12	88
St. Paul	33	10	[illegible]	0	0	4	0	0	0	19	58
Iowa											
Davenport	3	2	4	1			0	0		0	
Des Moines	6	11	2	17			0	0		0	
Sioux City	2	0	2	0			0	0		1	
Waterloo	2	10	0	1			0	0		4	
Missouri											
Kansas City	12	29	3	4	0	[illegible]	1	1	0	14	142
St. Joseph	3	2	0	4	0	1	0	0	0	0	38
St. Louis	37	20	4	4	0	18	1	0	0	19	254
North Dakota											
Fargo	2		0				0				[illegible]
Grand Forks	0	4	0	0			0	0		0	
South Dakota											
Aberdeen	3	1	0	0			0	0		0	
Sioux Falls	1	2	0	0			0	0		0	5
Nebraska											
Omaha	3	4	8	5	0	2	1	0	0	0	76
Kansas											
Topeka	3	7	1	8	0	0	0	0	0	7	29
Wichita	3	5	1	6	0	2	0	0	0	4	29
SOUTH ATLANTIC											
Delaware											
Wilmington	5	0	0	0	0	1	1	0	0	0	30
Maryland											
Baltimore	38	27	1	0	0	20	2	2	1	35	291
Cumberland	1	1	0	0	0	2	0	0	0	0	18
Frederick	0	0	0	0	0	0	0	0	0	0	2
District of Col.											
Washington	24	60	1	1	0	16	1	1	0	12	137
Virginia											
Lynchburg	0	0	0	0	0	2	0	1	0	12	16
Norfolk	1	6	0	0	0	4	0	0	0	1	
Richmond	2	4	0	0	0	1	0	2	0	3	54
Roanoke	1	0	1	0	0	1	0	0	0	0	23
West Virginia											
Charleston	1	5	0	0	0	2	0	0	0	1	45
Wheeling	2	2	0	0	0	0	1	0	0	0	18
North Carolina											
Raleigh	1	0	0	2	0	0	0	0	0	3	15
Wilmington	0	2	0	1	0	0	0	0	0	2	17
Winston-Salem	0	1	5	0	0	0	0	0	0	0	11

City reports for week ended March 31, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
South Carolina											
Charleston	0	0	1	0	0	4	0	0	1	1	40
Columbia	0	0	0	0	0	0	0	2	0	2	13
Greenville	0	0	1	0	0	1	0	0	0	2	6
Georgia											
Atlanta	4	11	6	1	0	10	0	0	0	2	92
Brunswick	0	0	0	0	0	0	0	0	0	0	11
Savannah	0	2	0	34	0	0	1	1	1	0	35
Florida											
Miami	2	1	0	0	0	2	0	1	0	0	25
St. Petersburg	1		0		0	0	0		0		14
Tampa	0	5	1	0	0	1	1	3	0	0	24
EAST SOUTH CENTRAL											
Kentucky											
Covington	1	2	0	1	0	3	0	0	0	0	31
Louisville	6	30	1	1	0	12	2	0	0	0	135
Tennessee											
Memphis	5	6	4	2	0	9	0	0	0	1	79
Nashville	2	0	0	0	0	5	0	0	0	5	53
Alabama											
Birmingham	2	0	8	1	0	5	1	1	0	3	67
Mobile	0	3	1	1	0	1	0	1	0	0	26
Montgomery	0	0	1	0			0	0		0	-
WEST SOUTH CENTRAL											
Arkansas											
Fort Smith	0	0	0	0			0	0		0	---
Little Rock	1	3	1	0	0	2	0	0	0	0	-
Louisiana											
New Orleans	6	7	1	0	0	21	2	2	0	6	179
Shreveport	0	1	1	0	0	2	0	0	0	3	33
Oklahoma											
Oklahoma City	2	6	3	20	0	3	0	0	0	0	38
Texas											
Dallas	2	21	4	7	0	3	0	1	0	2	66
Fort Worth	1	2	2	9	0	1	0	[illegible]	0	0	44
Galveston	0	2	0	0	0	0	0	0	0	0	12
Houston	2	1	1	2	0	6	0	0	0	0	70
San Antonio	1	1	0	0	0	1[illegible]	0	0	0	0	86
MOUNTAIN											
Montana											
Billings	1	0	0	0	0	0	0	0	0	2	7
Great Falls	1	0	1	2	0	0	0	0	0	6	9
Helena	0	0	0	0	0	0	0	0	0	0	2
Missoula	1	0	0	0	0	0	0	0	0	3	5
Idaho											
Boise	1	0	1	0	0	0	0	0	0	3	11
Colorado											
Denver	13	17	2	0	0	10	0	0	0	24	92
Pueblo	2	4	0	0	0	0	0	0	0	2	8
New Mexico											
Albuquerque	0	0	0	0	0	4	0	0	0	0	15
Utah											
Salt Lake City	2	0	1	13	0	6	0	0	0	4	45
Nevada											
Reno	1	0	0	1	0	0	0	0	0	0	4
PACIFIC											
Washington											
Seattle	9	9	3	1			0	0	-	1	--
Spokane	7	11	5	6			0	0		0	---
Tacoma	2		4				1			-	--
Oregon											
Portland	7	1	7	43	0	1	1	0	0	0	--
California											
Los Angeles	28	28	5	0	0	26	1	1	1	21	250
Sacramento	1	3	0	2	0	3	0	0	0	1	27
San Francisco	16	28	3	0	0	11	1	0	1	21	166

City reports for week ended March 31, 1928—**Continued**

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston [1]	0	0	0	1	0	0	0	0	....
MIDDLE ATLANTIC									
New York:									
New York	13	14	0	3	0	0	0	2	1
Pennsylvania:									
Philadelphia	1	1	2	2	0	0	0	0	0
Pittsburgh	2	2	0	0	0	0	0	1	1
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	0	0	0	0	0	0	0	0	1
Cleveland	0	0	0	0	0	1	0	2	0
Columbus	0	0	1	1	0	0	0	0	0
Illinois:									
Chicago	8	5	1	0	0	0	1	0	0
Michigan:									
Detroit	3	3	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee	2	3	0	0	0	0	0	0	0
Superior	2	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
Iowa:									
Davenport	0	0	0	1	0	0	0	0	0
Missouri:									
Kansas City	6	3	0	0	1	1	0	1	0
St. Louis	5	2	0	0	0	0	0	0	0
SOUTH ATLANTIC [2]									
Maryland:									
Baltimore	1	1	0	0	0	0	0	0	0
District of Columbia:									
Washington	0	0	0	0	0	0	0	1	0
Georgia:									
Atlanta	1	1	0	0	0	1	0	0	0
Savannah [2]	0	0	0	0	1	0	0	0	0
Florida:									
St. Petersburg	0	1	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	2	0	0	0	0	0	0	0	0
Nashville	0	0	1	0	0	0	0	1	0
Alabama:									
Birmingham	0	1	0	0	0	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	1	0	0	0
Louisiana:									
New Orleans	1	0	0	0	3	1	0	0	0
Shreveport	0	0	0	0	0	2	0	0	0
Oklahoma:									
Oklahoma City	2	0	0	1	0	0	0	0	0
Texas:									
Dallas [2]	0	0	0	0	2	0	0	0	0

[1] Rabies (human): 1 case and 1 death at Boston, Mass.
[2] Dengue: 1 case at Charleston, S. C., 1 case at Savannah, Ga., and 1 case at Dallas, Tex.

City reports for week ended March 31, 1928—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
MOUNTAIN									
Colorado									
Denver	5	7	0	0	0	0	0	0	0
Pueblo	1	0	0	0	0	0	0	0	0
Utah.									
Salt Lake City	0	1	0	0	0	0	0	0	0
Nevada:									
Reno	0	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	1		0		0		0	0	
Spokane	1		0		0		0	0	
Oregon:									
Portland	1	0	1	0	0	0	0	0	0
California.									
Los Angeles	2	1	0	0	0	0	0	0	0
Sacramento	1	0	0	0	0	1	0	0	0

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended March 31, 1928, compared with those for a like period ended April 2, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, February 26 to March 31, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Mar 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928
101 cities	182	172	183	172	176	158	178	158	190	[2] 139
New England	163	140	128	145	137	136	130	124	137	110
Middle Atlantic	223	233	230	214	240	212	226	222	263	181
East North Central	176	164	165	171	157	135	178	148	159	146
West North Central	115	113	133	131	127	115	121	132	158	[3] 85
South Atlantic	195	130	155	124	141	139	146	112	157	121
East South Central	81	90	112	85	80	105	41	60	61	85
West South Central	149	92	190	168	161	136	174	116	178	108
Mountain	233	186	197	97	126	106	81	80	108	115
Pacific	133	141	198	171	165	125	193	105	170	[4] 78

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] Fargo, N. Dak., and Tacoma, Wash , not included
[3] Fargo, N. Dak , not included.
[4] Tacoma, Wash., not included.

Summary of weekly reports from cities, February 26 to March 31, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

MEASLES CASE RATES

	Week ended—									
	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928
101 cities	880	1,126	952	1,131	929	1,349	943	1,326	837	[2] 1,390
New England	172	1,979	198	1,657	212	2,277	198	1,536	206	2,014
Middle Atlantic	67	1,000	80	970	93	1,213	114	1,393	127	1,491
East North Central	1,173	761	1,169	865	1,233	1,063	1,138	1,009	925	1,023
West North Central	952	341	1,241	489	1,560	590	1,514	725	1,821	[3] 750
South Atlantic	794	2,576	783	2,784	1,010	2,972	972	2,893	1,091	2,905
East South Central	538	1,541	314	1,307	441	1,855	436	1,426	284	1,696
West South Central	720	1,695	1,187	1,300	1,026	1,328	1,754	1,120	935	836
Mountain	8,132	142	9,091	283	5,397	345	5,074	504	3,443	752
Pacific	3,030	892	3,252	904	2,923	830	3,163	807	2,761	[4] 650

SCARLET FEVER CASE RATES

	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928
101 cities	418	295	446	303	431	300	423	309	440	[2] 304
New England	423	347	591	377	540	402	479	411	530	405
Middle Atlantic	532	345	583	358	572	352	580	374	612	398
East North Central	390	309	369	292	353	296	347	306	329	266
West North Central	443	261	471	290	426	271	400	292	467	[3] 254
South Atlantic	180	254	193	268	220	223	179	221	197	221
East South Central	218	214	279	259	208	160	102	234	172	204
West South Central	66	96	120	128	62	208	58	124	54	144
Mountain	1,076	257	1,112	195	1,336	248	1,130	177	1,210	186
Pacific	329	194	285	192	253	217	360	202	340	[4] 213

SMALLPOX CASE RATES

	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928
101 cities	21	17	30	22	31	21	30	25	28	[2] 25
New England	0	0	0	0	0	0	0	0	2	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	21	18	34	14	33	26	29	18	33	24
West North Central	53	62	53	92	49	64	69	125	30	[3] 65
South Atlantic	52	19	54	25	51	33	41	23	61	68
East South Central	122	0	81	20	132	20	106	25	122	30
West South Central	50	20	70	36	45	44	74	36	62	36
Mountain	0	53	0	115	90	53	18	62	9	142
Pacific	13	49	94	69	84	38	99	61	68	[4] 24

TYPHOID FEVER CASE RATES

	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928
101 cities	9	10	8	4	7	4	8	4	8	[2] 5
New England	2	0	12	2	5	7	5	9	12	5
Middle Atlantic	5	8	8	3	6	2	7	4	6	4
East North Central	6	7	1	4	4	3	4	3	1	2
West North Central	10	6	4	2	0	4	4	0	2	[3] 2
South Atlantic	23	12	11	9	11	11	13	11	16	21
East South Central	41	50	30	5	20	10	41	5	20	10
West South Central	8	32	17	4	12	12	29	8	25	12
Mountain	9	9	0	0	9	0	0	0	0	0
Pacific	8	8	10	3	18	5	10	5	24	[4] 3

[2] Fargo, N. Dak., and Tacoma, Wash., not included.
[3] Fargo, N. Dak., not included.
[4] Tacoma, Wash., not included.

Summary of weekly reports from cities, February 26 to March 31, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

INFLUENZA DEATH RATES

	Week ended—									
	Mar. 5, 1927	Mar. 3, 1928	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928
95 cities	25	24	27	22	31	25	27	32	22	[2] 29
New England	9	7	12	21	19	7	7	9	12	11
Middle Atlantic	24	16	25	19	31	26	26	22	21	29
East North Central	23	17	16	16	18	12	16	35	15	24
West North Central	17	10	14	12	21	16	14	16	4	[3] 19
South Atlantic	47	32	70	25	79	19	65	39	38	21
East South Central	21	84	80	42	90	84	96	89	106	78
West South Central	38	103	47	74	21	115	25	98	30	86
Mountain	54	88	54	62	18	80	27	133	27	53
Pacific	17	24	7	20	14	10	28	7	24	[4] 15

PNEUMONIA DEATH RATES

95 cities	171	190	188	191	184	221	167	213	163	[2] 222
New England	202	193	188	205	172	239	156	182	156	225
Middle Atlantic	193	217	222	221	226	258	198	245	186	264
East North Central	132	148	157	156	142	194	141	211	147	207
West North Central	104	106	81	96	114	139	101	118	93	[3] 132
South Atlantic	229	217	272	214	262	214	218	240	225	230
East South Central	271	240	186	272	191	335	197	240	133	288
West South Central	183	263	161	254	195	263	136	275	161	242
Mountain	126	265	170	265	161	203	170	168	161	106
Pacific	121	155	148	122	93	125	110	101	128	[4] 109

[2] Fargo, N. Dak., and Tacoma, Wash., not included.
[3] Fargo, N. Dak., not included.
[4] Tacoma, Wash., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

TYPHUS FEVER ON VESSEL

Steamship "Gaika"—At Durban, Union of South Africa, from Island of Mauritius.—Under date of March 9, 1928, the arrival of the steamship *Gaika* from Island of Mauritius, with a case of typhus fever on board, was reported from Durban, Natal, Union of South Africa. The *Gaika* left London December 22, 1927, for Mauritius, passed Las Palmas, Canary Islands, December 29, 1927, Cape Town January 18, arrived at Mauritius January 31, 1928, and sailed for London via Durban and ports February 8, 1928.

THE FAR EAST

Report for the week ended March 17, 1928.—The following report for the week ended March 17, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Ceylon.—Colombo.
Dutch East Indies.—Cheribon.

CHOLERA

India.—Bombay, Tuticorin, Rangoon.
Siam.—Bangkok.
French Indo-China.—Saigon.

SMALLPOX

Iraq.—Basrah.
India.—Bombay, Madras, Rangoon.
French India.—Pondicherry.
Straits Settlements.—Singapore.
French Indo-China.—Tourane.
Dutch East Indies.—Belawan-Deli, Banjermasin.
China.—Canton, Shanghai, Hong Kong.

Returns for the week ended March 17 were not received from the following ports:

India.—Calcutta.
Dutch East Indies.—Samarinda.
Kwantung.—Port Arthur, Dairen, towns of the South Manchurian railway zone.
Union of Socialist Soviet Republics.—Vladivostok.

AUSTRIA

Communicable diseases—January 1 to 28, 1928.—During the period January 1 to 28, 1928, communicable diseases were reported in Austria as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	6	1	Puerperal fever	18	12
Chicken pox	789		Scarlet fever	496	4
Diphtheria	665	13	Trachoma	52	
Dysentery	12		Typhoid fever	61	5
Paratyphoid fever	29	2	Typhus fever	[1] 1	

[1] Vienna.

CANADA

Provinces—Communicable diseases—Week ended March 24, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended March 24, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal meningitis			2	1				3
Influenza	15			12				27
Smallpox				35		7	20	62
Typhoid fever		10	8	2			4	24

Quebec Province—Communicable diseases—Week ended March 31, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended March 31, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	221	Scarlet fever	90
Diphtheria	52	Smallpox	35
German measles	19	Tuberculosis	54
Influenza	5	Typhoid fever	15
Measles	273	Whooping cough	20
Poliomyelitis	1		

CZECHOSLOVAKIA

Communicable diseases—February, 1928.—During the month of February, 1928, communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	5	1	Paratyphoid fever	4	1
Cerebrospinal meningitis	14	6	Puerperal fever	42	21
Diphtheria	870	73	Scarlet fever	1,315	29
Dysentery	8	1	Trachoma	198	
Malaria	3		Typhoid fever	452	44

DENMARK

Communicable diseases—January, 1928.—During the month of January, 1928, communicable diseases were reported in the Kingdom of Denmark, as follows:

Disease	Cases	Disease	Cases
Anthrax	1	Paratyphoid fever	3
Cerebrospinal meningitis	12	Puerperal fever	22
Chicken pox	99	Pneumonia	480
Diphtheria	681	Scabies	1,082
Erysipelas	281	Scarlet fever	304
Influenza	5,877	Tetanus	4
Lethargic encephalitis	11	Tuberculosis, pulmonary	270
Measles	6,883	Typhoid fever	8
Mumps	704	Whooping cough	1,469

Population of Denmark 3,491,000.

DOMINICAN REPUBLIC

Leprosy.—A report dated March 5, 1928, states that there were at that time 56 leper patients in the National Leprosarium and that about 20 lepers were isolated in their homes in the Dominican Republic. The National Leprosarium is located about 17 kilometers from Santo Domingo. The population of the Dominican Republic is said to be about 1,000,000.

FRENCH SUDAN AND UPPER VOLTA

Smallpox—February 16–29, 1928.—During the two weeks ended February 29, 1928, smallpox was reported present in the French Sudan with 1 case and in the Upper Volta with 5 cases.

ITALY

Communicable diseases—January 2–15, 1928.—During the two weeks ended January 15, 1928, communicable diseases were reported in the Kingdom of Italy, as follows:

Disease	Jan. 2-8, 1928		Jan. 9-15, 1928	
	Cases	Communes affected	Cases	Communes affected
Anthrax	28	26	25	28
Cerebrospinal meningitis	7	7	19	15
Chicken pox	307	108	365	125
Diphtheria	435	264	480	272
Dysentery	5	3	2	2
Lethargic encephalitis	3	3	6	6
Measles	2,135	277	2,506	297
Poliomyelitis	10	9	9	9
Rabies			1	1
Scarlet fever	369	146	396	174
Smallpox	1	1	2	2
Typhoid fever	548	298	477	276

JAMAICA

Smallpox (alastrim)—February 26–March 24, 1928.—During the period February 26 to March 24, 1928, 11 cases of smallpox, reported as alastrim, were notified in the island of Jamaica, occurring in localities not included in the Kingston area.

Other communicable diseases.—During the same period, other communicable diseases were reported in the island as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	1	11	Puerperal fever		1
Dysentery	10	25	Tuberculosis	17	48
Erysipelas		2	Typhoid fever	20	63

Population: Kingston, 62,707; island, 926,000.

LATVIA

Communicable diseases—January, 1928.—During the month of January, 1928, communicable diseases were reported in the Republic of Latvia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	4	Poliomyelitis	1
Diphtheria	42	Puerperal fever	4
Erysipelas	17	Scarlet fever	240
Influenza	36	Tetanus	1
Leprosy	6	Trachoma	22
Measles	239	Typhoid fever	60
Mumps	7	Whooping cough	46

Population: 1,950,000.

MADAGASCAR

Plague—January 1 to 15, 1928.—During the 15 days ended January 15, 1928, 199 cases of plague with 188 deaths, were reported in the island of Madagascar. The distribution of occurrence by Provinces was as follows: Ambositra—cases 54, deaths 54; Antisirabi—cases 43, deaths 43; Itasy—cases 13, deaths 13; Moramanga—cases 19, deaths 19; Tananarive—cases 70, deaths 59, including Tananarive Town with 5 cases, 4 deaths. The distribution by type was as follows: Bubonic, 123; pneumonic, 41; septicemic, 35.

MALTA

Communicable diseases—January-February, 1928.—Communicable diseases were reported in the island of Malta during the months of January and February, 1928, as follows:

Cases reported

Disease	January, 1928	February, 1928	Disease	January, 1928	February, 1928
Broncho-pneumonia	11	11	Pneumonia	4	5
Chicken pox	24	14	Puerperal fever		1
Diphtheria	11	4	Scarlet fever	4	6
Erysipelas	2	2	Trachoma	21	26
Influenza		1	Tuberculosis	17	15
Lethargic encephalitis	1		Typhoid fever	37	29
Malta (undulant) fever	38	39	Whooping cough	8	2
Measles	2				

Population (civil), estimated, 227,440.

MEXICO

State of Jalisco—Smallpox—April 5, 1928.—On April 5, 1928, an epidemic of smallpox was reported in eastern Jalisco, Mexico.

PERU

Arequipa—Mortality—February, 1928.—During the month of February, 1928, 73 deaths from all causes, including 12 deaths from gastroenteritis and 22 from tuberculosis, were reported at Arequipa, Peru.

SENEGAL

Plague—Smallpox—February 16-29, 1928.—During the two weeks ended February 29, 1928, 17 cases of plague with 13 deaths were reported in the interior of Senegal. During the same period smallpox was reported in the interior of Senegal, in the district of Dakar, and in Mauretania.

UNION OF SOUTH AFRICA

Plague—Orange Free State—Week ended February 25, 1928.—During the week ended February 25, 1928, a case of plague was reported in the Orange Free State, occurring on a farm.

Smallpox.—During the same period an outbreak of smallpox was reported in the Orange Free State.

Typhus fever.—During the same period typhus fever was reported in one district of the Cape Province and in two districts of the Orange Free State.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928		
							24	31	7	14	21	28	4	11	18	25	3	10	17
China:																			
Amoy	C	28	72	16															
	D	7	3																
Canton	C	31	36	14	12	1													
	D	16	25	14	11	1													
Foochow	C	P	P	P															
Hong Kong	C	P	1	P															
Shanghai (settlement and concession)—																			
Foreigners only	C	1	6	3															
Including natives	D	20	74	7															
Swatow	C	42	P	P	P														
	D		P	P	P														
Tientsin	C	P	15	2	P	1													
Dutch East Indies: Java—Batavia	C				28	3													
	D				18	3													
India	C	45,163	31,390	20,160	23,047	25,139	4,624	3,960	3,550	3,243	3,267	3,097	3,026	3,001					
	D	22,051	15,895	10,371	12,863	17,026	2,617	2,353	2,046	1,847	1,765	1,739	1,684	1,562					
Bassein	D												1			1	1		
Bombay	C	42	3		2							1							
	D	30	2		2													1	1
Calcutta	C	87	76	101	199	428	69	42	43	22	39	36	70	58		80	99		
	D	40	39	64	138	281	48	34	27	16	18	24	38	32	35	42	63	101	
Madras	C	547	59	14	13	1				1	1			1		3	11		
	D	278	48	8	7	2				1		3		1	2	2	7	7	
Madras Presidency	C	7,660	3,056	2,050	3,073	3,702	503	382	482	497	1,163	1,301	1,305						
	D	3,513	1,581	1,055	1,736	2,104	241	209	254	280	623	813	726						
Negapatam	C										4								
	D										4	1		1	2	2			
Rangoon	C	1	2	6	2	8	1	2		1	4		1	1	10		3		
	D	1	2	5	5	6	1	1		1			1	1	8	4	2	4	2
Tuticorin	C			1		8													
	D			1	37	14													1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928		
							24	31	7	14	21	28	4	11	18	25	3	10	17
India (French):																			
Chandernagor	C	1	1		6	10	6	3	4	1	1		5				•		
	D	1			6	10	4	2	2	1			1						
Karikal	C	18	1		1	1			6	2	9	7	8	8					
	D	12	1		1	1			4		5	4	5	5					
Pondicherry	C	12	15		1	25	4	1	2	4	2	3	2	5					
	D	11	15		1	21	6	1	2	3	2	3	2	3					
Indo-China: Saigon	C		1	1					2	1	1	1		2	1	5		8	27
	D								1					1	1	1		6	19
Iraq [1]																			
Philippine Islands: Manila	C	1																	
Siam	C	77	40	18	110	88	24	24	13	49	50	33	48	69	74	59			
	D	53	24	11	76	64	18	21	5	36	34	21	42	42	50	38			
Bangkok	C	2	3	5	4	3	2	3	7	9	11	28	28	34	23	17	12		8
	D	1	1	3	2	2	2	1	3	5	7	16	26	17	12	11	7		5
Straits Settlements: Singapore	C				7	5	3	15	3	2	2			1					
	D				5	4	1	4	5	2	1								
On vessel:																			
S. S. Adrastus: At Yokohama, Japan	C	1																	
	D	1																	
S. S. Tabaristan: At Basra, Iraq	C			1															

Place		July-September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928		
				1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Indo-China (French):															
Annam	C	3,179	226	13	75	38	16	2		79	95	93	23	36	14
Cambodia	C	251	180	56	1	28	21	12	39	30	9	15	38	22	51
Cochin-China	C	469	178	21	27	52	17	38	58	46	119	130	178	113	153
Laos	C	246	67	10											
Tonkin	C	1,297	1			1			2	1					
Kwangchow-wan	C	16													

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 69 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

PLAGUE

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927: 24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25	March, 1928: 3	10	17	24	31
Algeria: Oran	C	4	1		2																
	D	3	1																		
Arabia: Aden	C									19	13	22	54	89	63	45	77	158	189		
	D									7	8	8	33	55	50	31	26	99	134		
Argentina:																					
Bahia Blanca district	C					3															
Buenos Aires	C													2							
Cordoba Province	C	2		P	P	10	1	1													
Entre Rios	C	5																			
Firmat	C					1															
Quilino	C					3															
Rosario	C					4	2	3				4			1						
Santiago Province	C														1						
Ucacha	C					1															
Azores: St. Michaels Island	C	2	2	3	3	3	1		1		3	1	2	2	1	1	1		1		
	D		1	1		1				1	1	1	1	1			1		1		
Brazil:																					
Bahia	C							1	2	1	2		2	1	4						
	D							1	1	2		1	2	1	2						
Porto Alegre	C																2				
Rio de Janeiro	C										1		1	2	1	1					
	D													1	2						
British East Africa:																					
Tanganyiki	C	P		P	P	P	P						2								
	D												2								
Uganda	C	456	226	99	99	67															
	D	345	158	88	96	61															
Canary Islands:																					
Las Palmas	C			9		3			2	1	1				1				2		2
	D					1				1	1				1						
Teneriffe	C										1	3	3	3							
	D										1		3								
Ceylon: Colombo	C	1	3	1		6	3	2	1	1	1	1	1		3	3	4	1	3		
	D		3			6	3	1	1	1	1	1			1	3	1	1	3		
China:																					
Tientsin	C	2																			
Tungliao	D			200																	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928				
							24	31	7	14	21	28	4	11	18	25	3	10	17	24	31
Dutch East Indies:																					
Balik-Papan	C						1														
	D						1														
Celebes—Makassar	C				6	2	2	1		3	2	1	1	1		1					
	D				6	2	2	1		2	2	1	1	1		1					
Java	D		432	779	829	1,017	209	179	176	187											
Batavia and West Java	C	71	68	130	132	154	32	36	24	36	46	37	27	31							
	D	71	68	129	132	152	32	36	24	36	44	37	27	31							
Cheribon	C					1															
	D					1															
East Java and Madura	C	28	18	17	10	8	3	2	1	1	5	2									
	D	27	18	17	10	8	3	2	1	1	5	2					P				
Pasoeroean Residency	C					P															
Surabaya Residency	C					P															
Surakarta Residency	C				P	P															
Egypt:																					
Alexandria	C	2	1			12	3	2					1		1						
	D					7	1	1					1		1						
Cairo	C							2													
	D							2													
Suez	C		1							1	1		3		3	4		3		4	
	D									1	1		1		3	3	2	1		2	
Greece:																					
Athens and Piraeus	C	1	3	1				2	1												
	D			1				1													
Mitylene	C	1	5	1	3	3															
Patras	C	2	2	1	1																
	D			1	1																
Hawaii Territory: Hawaii	D	1													1						
India	C	1,391	2,710	3,246	3,600	5,518	1,085	1,197	2,596	2,219	2,544	2,699	3,601	3,808							
	D	836	1,428	1,792	2,065	3,269	733	899	1,804	1,498	1,653	1,661	2,577	2,630							
Bassein	D	12	14	8	4	4	2	13	2		3	3		2	1	2	4	5	5		
Bombay	C	14	7	4				1		2	5	4	2	3	5	14					
	D	11	5	3				1		1	2	2	3	2	6	14	7	6	4		

[illegible]	C		1[illegible]																		
	D		10									1									
Madras Presidency	C	620	465	583	470	791	174	167	56	153	107	132	79		142		185				
	D	321	230	298	282	359	69	27	38	72	63	64	60		79		100				
Rangoon	C	15	6	11	11	15	2	4	4	7	8	9	7	11	15	16	6				
	D	14	6	11	11	15	3	3	4	7	7	7	6	10	12	15	6	10	4		
Indo-China: Saigon	C		2		1																
Iraq:																					
Baghdad	C										1	1		2		1	1				
	D											1		1		1	1				
Dulaim Liwa	C												1								
Nigeria: Lagos	C				17	13	2	1	1	6	2	3	3	2	2	3	2				
	D				17	13	1	1	1	5	3	3	3	2	2	3	2				
Senegal: [1]																					
Baol	C	33	72	95	P	P															
	D	13	33	40																	
Cayor	C	227	463	176	48																
	D	166	233	88	28																
Dakar	C	46	20	1																	
	D	32	12																		
Louga	C		5	8																	
	D		4																		
Rufisque	C	44	16																		
	D	38	12																		
Thies	C		9	1	1																
	D		7																		
Siam	C			13	1	3	1	7	4	4	5	3	6	6	13	4					
	D			9		2	1	1	5	4	1	1	5	5	10	4					
Bangkok	C			2				1				1	1		1						
	D				1			1				1	1		1						
Straits Settlements: Singapore	C				1								1	1	1		1				
	D				1								1	1	1						
Tunisia [2]																					
Turkey: Constantinople	C		1	1		2															
	D			1		1															
Union of South Africa:																					
Cape Province	C				2	2					1										
	D				2	1					1										
Orange Free State	C				1	8						2		3	4	1					
	D				1	6						1		3	1						
U. S. S. R.:																					
Chita district	C			1																	
	D			1																	
Northern Caucasus	C		14	1																	
	D		10																		
Venezuela: State of Miranda—Tacata and Cua	C																		P		
On vessel:																					
At La Plata, from Rosario, Argentina	C							1													
S. S. Aghios Gerasimos, at Vigo, Spain	C				3																

[1] During January, 1928, 5 cases of plague were reported in interior of Senegal, and 17 cases with 13 deaths during last 2 weeks in February.
[2] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July-September	October	November	December	January	February
Algeria: Algiers	C		2				
British East Africa: Kenya	C	95	18	28	16	26	
Ecuador: Guayaquil	C	15	4	9	5	4	6
	D			3	2	4	3
Indo-China (French)	C	14	3	3	4	7	
Madagascar	C	314	166	209	317	427	342
	D	286	155	189	261	388	317
Ambositra Province	C	7	6	1	18	105	67
	D	7	6	1	10	96	66
Antsirabe Province	C	39	19	18	72	117	108
	D	38	19	17	72	117	108
Itasy Province	C	46	16	26	62	33	19
	D	41	15	25	54	29	17
Moramanga Province	C	12	24	46	25	19	25
	D	12	20	41	22	19	24
Madagascar—Continued.							
Tananarive Province	C	211	99	170	139	155	123
	D	189	93	153	108	129	102
Mauritius	C	1					
Nigeria	C	32	27	16	20	16	
	D	29	27	16	18	16	
Peru	C	34	14	6	14		
	D	19	5	2	4		
Callao	D	3			3		
Lima	C				7		
	D		1	1	1		
Syria: Beirut	C				2		

SMALLPOX

Place		July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928				
							24	31	7	14	21	28	4	11	18	25	3	10	17	24	31
Algeria	C	459	382	683	661	170	81	26	7	15	17	18	20	16	30						
Algiers	C					3	3	4		2	3	1	7	4	4		5	1			
Oran	C	9	16	11	20	39	8	15	2	4	2	2	4	3	1		2	2			
Arabia: Aden	C				1	3	1								1						

Brazil:																					
Para	C	1																			
Rio de Janeiro	C	6	10		1																
	D	4	9		1																
British East Africa: Tanganyiki	D	21	8	P	P	P			2	6	4		1								
British South Africa:																					
Northern Rhodesia	C	55	39	16	185	252	2	81	141	12	3		230		79	117					
	D	1	2	11	64	62		8	23				23		5	32					
Southern Rhodesia	C				3	2	1						P	3	2	4					
	D															1					
Canada:																					
Alberta	C	17	17	23	10	19		3	3	5	1	19	1	6		3		7	7	20	
Calgary	C	1																	1		
Edmonton	C			1	1	8			3	2	1			2	1		11	1	1	11	1
British Columbia: Vancouver	C		2			4	1	3	3	1	11	3	1	11	2	1	3	4	2	5	
Manitoba	C	13	9	7	19	7	2	2	2	5		1									
Winnipeg	C	5	4	2	2	2	1			1	1	1									
New Brunswick [1]	C						1									1					
Nova Scotia	C		2	1																	
Halifax	C		1	1																	
Ontario	C	60	22	96	264	347		53	83	76	52	77	63	51	40	51	36	20	19	35	
Hamilton	C					2													2		
Kingston	C				1		1							1							
Ottawa	C	27	40	67	134	63	18	9	10	23	20	16	23	9	11	3	1	7	6	8	10
Toronto	C		2	10	34	39	7		11	10	8	5	1	6	4	4	2	4	2	3	3
Windsor	C			9																	
Quebec	C	1		8	25	16	14	3	10	17	7		11	8	11	13		18	22		35
Montreal	C				1		1		1	6	3	4	1		5	1	3		6	3	
Quebec	C					4		2		3		5				2	5	4	3	4	4
Riviere du Loup	C				3																
Saskatchewan	C	14	68	31	34	58	12	13	15	12	39	15	9	34	7	8		7	14	7	
Moose Jaw	C	10	16	3		1		1	2	1	4	2	3	2		2	6	5	2	5	
Regina	C	8		5	1	1															
Saskatoon	C					2		4			13	1		1		2					
Ceylon: Colombo	C	1			1	2					1		1	2	2	1	3				
	D	1				1					1										
China:																					
Antung	C									1											
Canton	C		1																		
	D		1																		
Chefoo	C		1	P		P															
	D		1														1				
Foochow	C	P	P	P	P	P	P	P		P		P		P		P					
Hong Kong	C	1	2							1	1		1		1	3		3	5		
	D	1	2						1			1	1			1	1	2			
Manchuria—																					
Changchun	C					1						4									
Dairen	C			1	2	1			2	3	1		5	9	3						
	D			1								1	2	5	4						
Fushun	C		1		1																

[1] The report of 2 cases of smallpox in New Brunswick during the week ended Sept. 24, 1927, which has been published in prior issues of the Public Health Reports, was erroneous. No smallpox was reported in New Brunswick during September, 1927.

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CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928				
							24	31	7	14	21	28	4	11	18	25	3	10	17	24	31
China—Continued.																					
Harbin	C					2		1				2	1	2	2						
Mukden	C			2	1							1		3	18		3				
Pensihu	C			1																	
Shanghai—																					
Foreigners only	C										1	2		2	1	1	1				
Including natives	D										3	2	3	3	5	4	4	6			
Tientsin	C		4	13	8	9	2			6	20	10	10	8	5						
Curacao (alastrim)	C										2				3						
Dominican Republic: Santo Domingo	C																		2		
Dutch East Indies:																					
Borneo—																					
Samarinda district	C				P																
South and East Borneo Residency	C	P																			
Java—																					
Batavia and West Java	C	4		4	25								1	3							
	D				15																
East Java and Madura	C	4	22	8	9	9		3	1	1	2										
	D			1																	
Sumatra: Medan	C					3		8		1	3	5	5	10	7	3					
	D					2		1		2	4	4		3							
Egypt	C		3			4		4								1					
	D		1	1		1															
Cairo	C					2															
Great Britain:																					
England and Wales	C	568	508	473	902	1,041	255	247	275	398	405	370	386	369	369	392	365	347	359	342	
Birmingham	C	1		1							14	17	11	2	1		2		1		
Bradford	C				11	19	2	2	4	24	6	9	7	2	7	1		4	9		
Bristol	C			6	4	8						2		1			1	3		2	
Cardiff	C				1				1												
Leeds	C	5	3	7	5	16	4	6	1		1			2	1	2	4	2	3	5	
Liverpool	C									1								1			
London	C										2			5	10	1	2	1	10	5	
Manchester	C			3	6	25		1	2	2				4	1	4	1	2	4	1	

Newcastle on Tyne	C	1	2	6	9	55	2	13	2	5	14	3	4	6	4	1	4	3	3	4
Nottingham	C								7	6	4	8	6	9	6	1	3	1	5	1
Sheffield	C	2	1	10	6	9	3		1	10	4		4		1	2	2	1		
Stoke on Trent	C	1							3	1			1		2	4	3	6	11	
Gr ce: Saloniki	D	2																		
In	C	5,911	4,398	3,153	4,052	6,731	2,225	2,502	2,664	3,285	4,129	3,631	5,159	4,858						
	D	1,668	1,120	715	927	1,650	515	578	551	785	964	803	988	954						
Bassein	C	1												1						
	D	1																		
Bombay	C	33	12	10	4	9		4	4	6	10	23	10	18	29	23	46	51	49	
	D	19	8	2	3	2					2	8	7	7	15	13	23	22	24	
Calcutta	C	27	22	5	5	25		17	9	14	14	11	23	10	9	18	14	30		
	D	25		6	2	11		17	4	6	10	7	10	7	5	11	10	24		
Madras	C	6	7	8	7	11	2		11	8	9	16	20	29	15	33	21	31	30	
	D		2		2	3	1		4	1	3	2	2	1	3	3	3	10	5	
Negapatam	C	3	1							5		4	2	2	1		1	1		
	D	2	1							3		2	1							
Rangoon	C	14	9	17	6	14	36	28	23	49	41	34	103	97	68	82	132	95	96	
	D	3	2	3	1	4	5	13	4	9	13	10	18	23	22	24	26	32	28	
Vizagapatam	C		3						3		2	1	5	2		1		1		
	D		2								6	1		1						
India (French):																				
Karikal	C	3	1	2	P															
	D	3	1	2																
Pondicherry	C	39	37	38	42	41	6	16	25	18	15	17	15				6	3		
	D	31	37	38	42	41	6	14	12	18	15	17	15				6	3		
Indo-China: Saigon	C	1	1			1		1	1	1								1		
Iraq:																				
Baghdad	C		1	7	5	25	9	9	3	2	7	6	3	3	2		3			
	D		1	4	4	14	7	3	2		3	5	2	1	1		1			
Basra	C	1	4	2	3	4		2			1				1		2	4	4	
	D	1	4	2	1	3		1											1	
Italy:																				
Leghorn	C																1			1
Rome and vicinity	C		1				2													
Ja aica (outside Kingston) (alastrim)	C	6	9	9	7	3		2				4	1		1	3		6	3	2
Kingston	C		3	2																
Ja n:																				
Nagasaki	C	2																		
	D	1																		
Tokyo	C										2	1		1		1				
	D											1								
M retania	C														P	P				
M ico:																				
Acapulco	C		2		1															
	D		2		1															
Chihuahua	D								1											
Guadalajara	D					2											1			
Manzanillo	D									1									1	
Mexico City and surrounding territory	C					4							1	1	2					
San Luis Potosi	D	1																		
Tampico	C															1				
Torreon	D	1		2																

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C, indicates cases; D, deaths, P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928				
							24	31	7	14	21	28	4	11	18	25	3	10	17	24	31
Palestine: Jerusalem	C					1						1									
	D											1									
Poland	C	2				1	5	1			1	1	1								
	D	1																			
Porto Rico	C																		P		
Portugal:																					
Lisbon	C		3	8	4	10	1	2	4	5	5	2	2	3	3	9	4		4		
	D					1															
Oporto	C		1																		
Senegal: Dakar	C															8					
Siam	C	51	27	6	1	9	2	5	8	8	13	7	5	10	1	7					
	D	10	15			1			2		1	1	2		1	1					
Bangkok	C		3		1	1		1	2												
	D		1						1												
Spain:																					
Malaga	D				1	1															
Seville	C									1											
Valencia	C			1				1	1									1		1	
Straits Settlements: Singapore	C				1								1		1				1		
Switzerland	C						2														
Tunisia: Tunis	C							2	2			3			2	4	2		1		
Union of South Africa:																					
Cape Province	C	P		P							P			P							
Orange Free State	C	P			P	P	P				P			P							
Transvaal	C			P	7																
Upper Volta	C														2	3					
Venezuela: Maracaibo	D		2	1										1				1			

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928		
						1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Algeria	C	376	459	382	682												
Oran	C	14	10	16	11												
Indo-China (French)	C	19	3	21	25	13	3	22	10	4	20		40	18	50	31	90
Syria:																	
Aleppo	C										1		1				
Beirut	C								1		1			15	11	26	
Damascus	C		3	5	22		13		4	6	2	11	2				

Place		July-September	October	November	December	January	February
Angola	C	51	73	71			
	D		2				
Congo	C	5	77				
Cuanza-Norte	C	1					
Cuanza-Sul	C		2				
Loanda	C	1					
Zaire	C	3	4	1			
Brazil: Porto Alegre	C	11	4	1			
British East Africa: Zanzibar	C		2				
	D		1				
Chosen	C	21	2	2		4	
	D	6		1		2	
Ecuador: Guayaquil	C	4	1	1	4	2	9
France	C	37	7	4	14	11	
Gold Coast	C	7	4				

Place		July-September	October	November	December	January	February
Greece	C	10	4		5	6	11
	D						2
Latvia	C		2				
Mexico	D	221	132	157			
Morocco	C	180	81	140	401	55	
Nigeria	C	820	223	93			
	D	173	51	30			
Persia	D			2		7	
Spain: Madrid	D			1			
U. S. S. R.:							
Railways, etc	C	26	7	11			
Other territories in Europe	C	366	220	471			
Transcaucasus, Siberia, and Central Asia	C	80	40	21			
Ukraine	C	27	11	20			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C, indicates cases; D, deaths, P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927: 24	December, 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24
Algeria:																				
Algiers	C											1					1	2	1	
	D																1			
Oran	C						1	1	1	1		2			2	1	6	1		1
Austria: Vienna	C												1							
Bulgaria: Sofia	C			17	6	1	1	4	1		1									
	D				1															
Chile:																				
Antofagasta	D			1																
Valparaiso	C		1		1	2				1							1			
	D	2	1		2															
China:																				
Manchuria—Harbin	C	2			1															
Tientsin	C		2																	
Egypt	C	2		12	4	14	1		3	4	2			1				1		
	D	3		5		8			3	1										
Cairo	C					3														
	D					3														
Port Said	C			1		1														
Ireland ((Irish Free State):																				
Cork County	C					3			1											
Donegal County, Letterkenny	C			4																
Mexico:																				
Guadalajara	D					1														
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	4	4	4	3	2	1		2	1		4	3	6	
	D				2	1	1	3	1								3	1		
Morocco	C								107	235	257	214	370	210	141			175		
Palestine	C	11	1	5	3	9				8		2	2	1	1	2	6	1		
Poland	C	50	35	19	64	93	26	33	68	68	101	92	87	66	57	62				
	D	6	2	4	11	10	1	3	6	6	4	3	5	7	10	3				
Portugal: Oporto	C	1			1									1						
Rumania	C	36	16	17	22	35	32	17	19				15	24		14				
	D	1		2				2	1				2	7						

Syria: Aleppo	C		2						2											
Tunisia	C	14	1	3	1	1	1			5	4				1				1	
Union of South Africa:																				
Cape Province	C	P	P	P	P	P	P	1	P		P	P	1	P	P	P				
Natal	C	P	P	P	P	2	2	P	P	1		P		1	P					
Orange Free State	C			P		P							P	P	P	P				
Transvaal	C	1		5	P	P														
On Vessel: S. S. Gaika at Durban, Natal—from Mauritius	C																	1		

Place		1927				November, 1927			December, 1927			January, 1928			Feb. 1-10, 1928
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	
Algeria	C	67	33	10	12										
	D	13			1										
Algiers	C	2	2	6	2										
Bulgaria	C	12	24	7	2						2	7	6		8
	D		1	2	1						1		1		1
Morocco	C	148	76	7	11	5	14	7	5	6	75				

Place		July-September	October	November	December	January	February
Argentina: Rosario	C			1			
	D				1	1	
China: Shanghai	D			1			
Chosen	C	90	16	26	38	183	
	D	8	1	2	3	19	
Chemulpo	C	3				1	
Gensan	C	2				1	
	D					1	
Seoul	C	5	2				
	D	1	1				
Czechoslovakia	C	12	1		6		
Greece: Athens	C	3			1	2	2
Japan	C	1		1			
Latvia	C	6					

Place		July-September	October	November	December	January	February
Lithuania	C	69	9	18	27	86	
	D	14	1	1	1	10	
Mexico	D	64	36	29			
Peru:							
Arequipa	D	3	2		1	2	
Lima	D	8					
U. S. S. R.:							
Railways, etc.	C	77	23	33			
Transcaucasus, Siberia, and Central Asia	C	208	61	49			
Ukraine	C	295	151	198			
Other territories in Europe	C	1,839	521				
Yugoslavia	C	20	1	1		7	
	D	5				3	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept 24, 1927	Sept 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
Ashanti: Obuasi	C		1																				
	D		1																				
Belgian Congo:																							
Boma	C														3								
	D														2								
Matadi	C														0	12	11	1	5	8			1
	D														2	6	8	2	5	6			
Dahomey:																							
Grand Popo	C									1													
	D									1													
Porto Novo	C	1																					
	D	1																					
Ivory Coast	C	1											1										
	D	1											1										
Liberia: Monrovia	C			1																			
Nigeria	C			2																			
	D			2																			
Senegal	C	3	10	21	31	9	16	6	6	7													
	D	3	9	21	31	8	10	4	4	6													
Dakar	C	1			12	3	6		5	2	1	4			1	1							
	D				7	2	4		4	2	1	4			1	1							
Togoland	C		1																				
	D		1																				

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

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APRIL 27 - - - - 1928

SPECIAL ARTICLES

Current World Prevalence of Communicable Diseases
Summaries of Recent State Mortality Statistics
Two Qualitative Tests for HCN in Ship Fumigation

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 43 APRIL 27, 1928 NO. 17

CURRENT WORLD PREVALENCE OF COMMUNICABLE DISEASES [1]

United States, March 11-April 7, 1928

The mortality in large cities increased during March, the average death rate in 68 large cities (annual basis) rising from 14.3 per 1,000 in the week ended March 10 to 15.3 in the week ended March 31, and to 15 in the week ende[illegible] 7. The seasonal increase continued unusually late, as th[illegible]ortality normally is expected by the middle of March, a[illegible]ge death rate in the cities for the two weeks ended April 7 [illegible]er than that for the corresponding weeks in any of the prece[illegible]g seven years except 1926, when influenza was epidemic. Nevertheless, as [illegible] result of the unusually favorable mortality in January and Feb[illegible]ary, the average death rate in the 68 cities in the first 14 weeks o[illegible] he current year (14.2) is as low as that in 1924 and lower than that in any recent years except 1927 and 1921.

Influenza and pneumonia.—Reported cases of influenza increased continuously up to the first week in April, when 31 states reported 3,386 cases, as compared with 2,163 cases in the week ended March 3. Some increase occurred in most of the States reporting, which are distributed throughout all sections of the United States. The mortality from influenza and pneumonia combined increased during the first half of March and in the week ended March 17, the latest available, the mortality was higher than in the corresponding week of 1927 in the cities reporting in each of the geographical districts except in the South Atlantic and Pacific States.

The excess mortality over the corresponding week of a year ago was especially marked in the East and West South Central States and in the Mountain States.

Meningococcus meningitis.—More cases of meningococcus meningitis have been reported during 1928 than in the corresponding weeks of either of the preceding two years. The number of cases increased quite sharply during March, as is shown in the accompanying table, and the cases reported in the four weeks ended April 7 indicate a prevalence more than twice that of a year ago.

[1] From the Office of Stati[illegible] Investigations, United States Public Health Service.

Number of cases of meningococcus meningitis reported by 42 States and the District of Columbia

Four weeks ended—	1926	1927	1928
Mar. 10	226	228	382
Apr. 7	215	255	577

Although some seasonal increase in the disease in the winter and spring months is normally expected, the rise in recent weeks has been unusually rapid; and it has been very general, about one-half of the States reporting 50 to 100 per cent increase in cases in the four weeks ended April 7 over the preceding four weeks. The highest incidence rate for the first 12 weeks of 1928 [1] occurred in the Mountain States and the next highest in the Pacific Coast States, while a low incidence is indicated for the South Cen[illegible] South Atlantic States and New England. The a[illegible] annual basis) for the 42 States was 4.9 per 100,000 p[illegible]. Apparently, it is a characteristic of the disease that wi[illegible] [illegible]arated places are often simultaneously affected and that only a rather small proportion of the population contract it.

Smallpox.—The number of cases of smallpox reported by 42 States and the District of Columbia has varied about a level of 1,100 cases weekly since early in January. For the four weeks ended April 7, the reported cases numbered 4,743, as compared with 3,933 in the corresponding period of 1927 and 3,370 in 1926. Several States reported an increase in the number of cases in the four weeks ended April 7 over the preceding four-week period; these include Arkansas, New Mexico, Colorado, California, Kansas, Missouri, Indiana, New Jersey, and West Virginia. In each of these States, except Indiana, the prevalence of smallpox was greater in the first quarter of 1928 than in 1927, as was true also of Arizona, Connecticut, Illinois, Iowa, Louisiana, Montana, Nebraska, North Carolina, Oklahoma, Oregon, Tennessee, Utah, Wyoming, and Wisconsin.

Marked improvement is indicated in the smallpox situation in Alabama, Florida, Georgia, and Virginia, where the disease was widely prevalent in 1927.

Scarlet fever.—The reported incidence of scarlet fever during March was approximately the same as it was in February, but the number of cases reported in the first week of April showed a slight decline. In a number of States, especially in those west of the Mississippi River, the seasonal decline was quite definite, but in others it was not yet apparent. In general, a gradual decrease in the number of cases may be expected throughout the spring months.

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[1] See Public Health Reports for April 6, 1928, p. 807.

Diphtheria.—The number of cases of diphtheria reported each week by 42 States continued to decline during March, and in the first week of April the reported cases numbered approximately 1,400, as compared with about 1,700 in the week ended March 10. The decline has been general and is normal for the season of the year.

Measles.—Measles incidence continued on a high level throughout March and in the first week of April, with the number of cases reported each week by 38 States averaging about 18,000. In a number of southern States in which the disease has been quite prevalent, the maximum incidence appeared to have been passed, notably in Alabama, Arkansas, Louisiana, Maryland, North Carolina, and South Carolina; but for Massachusetts, New York, New Jersey, Pennsylvania, Michigan, and Missouri the latest reports had shown no decline in the number of cases.

Poliomyelitis —One or more cases of poliomyelitis were reported during the four weeks ended April 7 by 34 States, which reported 122 cases in this period. Although the number of cases is fewer than that reported in the preceding four-week period, it is still more than double the number for the corresponding weeks a year ago In these four weeks, California reported 12 cases, New York 15, Ohio 10, Massachusetts and South Dakota 7 each, and Oregon 6 cases.

Typhoid fever.—The typhoid fever incidence has been lower throughout the first quarter of the current year than in either of the preceding two years. Cases reported by 41 States in the two weeks ended April 7 were somewhat more numerous than in the preceding two weeks—340 as compared with 270. The increase was due to very small increases in a number of States

Foreign Countries [1]

The general prevalence of certain epidemic diseases in most foreign countries during January and February is summarized below.

Cholera.—Cholera was reported during the four weeks ended February 25 from very few towns in the Far East. One case was reported at Singapore, 1 at Karikal, 8 cases were reported at Saigon, 102 at Bangkok, and cases were reported from several ports in India. The incidence at Bangkok was slightly higher than in the preceding four weeks; and the same was true at Calcutta, where 147 deaths occurred in these four weeks.

The cholera incidence in India continued to decline in January, but the disease was still widespread in two areas—Bengal and the Madras Presidency. Of the 10,154 cases reported in the first three weeks of 1928, 7,787 occurred in the Bengal-Assam-Orissa areas, 2,236 in Madras Presidency, and only 131 elsewhere in India.

[1] Data from the Monthly Epidemiological Report of the Health Section of the League of Nations' Secretariat, Mar. 15, 1928, supplemented by information published in the PUBLIC HEALTH REPORTS.

The cholera outbreak in Annam, reported last month, declined sharply in February; 59 cases were reported in the period February 1–20 as compared with 188 cases in the preceding 20 days. In Cochin-China the number of cholera cases was still increasing at the beginning of February, but the maximum seemed to have been passed in the first 10 days, when 178 cases were reported. The disease is not prevalent in the remainder of French Indo-China; a few cases were reported in Cambodia and none in Laos or Tonkin.

Plague.—No plague cases were reported in February in Mediterranean ports. At Suez 15 cases were reported between January 1 and February 20; all occurred inland 2 miles or more from the port.

The plague outbreak in Aden increased early in February, but no further increase was indicated by the reports for the latter part of the month. Up to March 3, 382 cases and 218 deaths were reported—figures much in excess of those for any previous outbreak since that of 1900. It is reported that the first cases occurred among the coal coolies and that the European quarters and wharves were free from infection up to February 6. Infected rats have been found, but not in large numbers.

The plague incidence in India as a whole during the first three weeks of 1928 was higher than during the corresponding period of the preceding year, but lower than in the years from 1923 to 1925. In the Punjab the plague situation remains very favorable, and only once before, in 1922, has the incidence been so low. More cases were reported, on the other hand, in the United Provinces than during either of the two preceding years. Two areas of these provinces are chiefly affected, one in the north around Bareilly, and another larger area in the east, including the districts of Azamgarh, Ghazipur, Fyabad, and Basti. Plague is present also in Muzaffarpur and other districts of Bihar, to the east of this area, but the incidence is well below the normal.

Deaths from plague in the Provinces of India during three weeks in January in the years 1924–1928

Provinces	1924	1925	1926	1927	1928
	Dec 30–Jan 19	Jan 4–24	Jan 3–23	Jan 2–22	Jan. 1–21
North-West Frontier Province	88	90	0	0	0
Punjab, Delhi, and Punjab States	1,992	2,648	1,426	392	200
United Provinces	1,918	3,479	1,920	1,134	2,203
Bihar and Orissa	808	711	380	326	199
Bengal and Assam	1	1	0	0	0
Central Provinces	1,134	1,041	344	413	366
Madras Presidency	575	541	259	210	197
Hyderabad	416	1,012	348	91	1,854
Mysore	191	50	329	151	58
Bombay Presidency	996	571	598	135	398
Burma	1,048	209	438	157	390
Other Indian States	139	140	162	63	21
Total	9,306	10,493	6,204	3,072	4,296

Hyderabad city is the scene of a more severe plague outbreak than has occurred there for many years past. The number of cases began to increase in November and appeared to have reached its maximum about the middle of January, which is usually the season of greatest prevalence in Hyderabad. Plague was prevalent also in the adjacent cantonment of Secundarabad.

Plague cases and deaths reported in Hyderabad City and suburbs by fortnightly periods, November 6, 1927, to January 14, 1928

Date	Cases	Deaths
November 6-19	96	71
November 20-December 3	197	126
December 4-17	407	281
December 18-31	900	693
January 1-14	1,393	1,108

In the Bombay Deccan, where epidemics normally reach their height in September or October, plague was unusually prevalent in January. The prevalence was high also in the Madura district in the extreme south of India.

Plague is more prevalent than usual in Upper Burma, which in the past has suffered much less than Lower Burma from this disease. During the first three weeks of January, 175 deaths from plague were reported in Lower Burma and 715 in Upper Burma. The last relatively severe epidemic in Upper Burma was in 1924, when the city of Mandalay was seriously affected.

The winter rains have been much in excess of the normal in most parts of India, and particularly over a wide belt stretching from the United Provinces in the north to the Deccan in the south. In northwestern India they have been about normal, i. e., scanty; and in Bengal, Assam, and Orissa, where there is no plague, they have been much less than usual. It has been long observed that a very wet winter favors the development of plague outbreaks in the following months. The plague incidence, which last autumn was unusually low, seems to have been unfavorably influenced in several areas, and especially in the eastern part of the United Provinces, in Hyderabad, the Bombay Deccan, and Upper Burma, by the humidity resulting from this increased rainfall.

Yellow fever.—Matadi, in Belgian Congo, was officially declared free from yellow fever on February 19; no fresh case had been reported since February 2.[1] The outbreak lasted from December 22 to February 2, and 19 cases with 10 deaths were notified among the white population and 18 cases with 14 deaths among negroes. There were 3 cases with 2 deaths at Boma. No yellow fever case has been reported elsewhere in Africa since the beginning of 1928.

[1] A case of yellow fever was reported at Matadi Feb. 24, 1928.—Ed.

Smallpox.—No change in the prevalence of smallpox in England and Wales occurred in February; 1,516 cases were reported in the four weeks ended February 25, as compared with 1,460 cases in the preceding four weeks, and 1,810 cases during the corresponding period of 1927. The chief centers of infection were still in the north of England and in South Wales. During the first eight weeks of the year seven deaths from smallpox occurred in the large towns, five of these being at Bradford.

On the European Continent, smallpox cases have occurred only sporadically for the most part. In Spain, 53 deaths were reported for November, 1927, and in Portugal 143 smallpox cases with 22 deaths were reported in January. Eleven cases of smallpox were reported in France in January. Smallpox is fairly widespread in the eastern part of the Union of Soviet Socialist Republics, in the Tartar, Bashkir, and Votyak Republics and in Viatka and the Ural area.

The smallpox situation in Algeria and Morocco improved markedly in January. Fifty-five cases were reported in Morocco and 57 in Algeria in January, as against 398 and 209, respectively, in December. The outbreak of virulent smallpox which began in June, 1927, in northern Rhodesia increased during the last months of the year; 1,079 cases and 182 deaths were reported during the whole of 1927, as compared with 305 cases and 8 deaths the preceding year.

Influenza.—Up to the end of February there had been no influenza outbreaks reported in Europe. Deaths from influenza in large towns of England and Wales averaged 94 a week between January 22 and March 3, and show no tendency to increase or decrease. Deaths ascribed to influenza in large German towns averaged 51 during the first six weeks of the year; their number did not increase during this period.

The number of cases reported in January in Denmark, Sweden, and Finland was about normal for nonepidemic years. In Leningrad 63 deaths were attributed to influenza in January, which is not indicative of epidemic prevalence. In Hungary, only 35 deaths were ascribed to influenza in January, as against 223 during the corresponding month of the preceding year.

Influenza was very prevalent in Japan in January and February, but on March 17 conditions were reported to have greatly improved. From January 1 to February 10, 1928, there were 27,411 cases of influenza and 395 deaths, according to a statement from the Home Office of Japan.

Acute poliomyelitis.—Poliomyelitis was more prevalent in 1927 than in any of the preceding three years in Germany, Austria, Rumania, and Canada. There was a decrease in the incidence in England, France, Denmark, and Australia, and not much change

in other countries. The number of cases reported in countries where this disease is notifiable by law is shown in the accompanying table.

Poliomyelitis cases reported in various countries, 1924–1927

Country	Number of cases			
	1924	1925	1926	1927
EUROPE				
Germany	498	386	1,614	2,740
England and Wales	860	422	1,297	899
Austria	19	15	47	149
Denmark	152	113	64	34
Finland	45	28	12	52
France	216	222	214	156
Italy	250	780	388	335
Norway (towns)	13	87	15	27
Netherlands	35	32	49	43
Rumania				2,161
Sweden	653	517	338	385
Switzerland	108	93	97	132
AMERICA				
Canada	217	167	113	610
United States	5,078	5,429	2,543	9,737
AUSTRALASIA				
Australia	238	261	174	67
New Zealand	73	1,319	29	43

The Rumanian epidemic began at Bucharest and was most widespread there and in the neighboring departments. Three-fourths of the cases occurred in 7 of the 76 departments into which the country is divided. Poliomyelitis had theretofore been very rare in Rumania. The proportion of very young children attacked was unusually large. At Bucharest 90 per cent of the cases were under 4 years of age, and the maximum incidence was between 1 and 2 years of age.

Diphtheria.—The diphtheria incidence was higher than usual during the latter part of 1927 and the beginning of 1928 in nearly all European countries.

The incidence of diphtheria in Poland and Italy was higher this winter than at any time during the past five years. The number of cases reported in Italy during the last quarter of 1927 was 6,924, as compared with 4,342 during the corresponding period of the preceding year. In Germany the incidence was about the same as that during the winter 1924–25, but was lower than in 1921–22. In England the number of cases was about the same as in 1922. A general increase of diphtheria also affected North Africa. In Egypt 1,251 cases were reported during the last quarter of 1927, as compared with 533 during the corresponding period of 1926.

The increase of diphtheria in Australia, which began during the fourth quarter of 1926 and reached its maximum in April, 1927, subsided toward the end of that year; 1,537 cases were reported during the last quarter of 1927, as compared with 2,270 during the corresponding period of the preceding year. The number of cases reported in 1927 was about the same as in 1923 and 1924, but less than half the number reported in 1921.

CURRENT STATE MORTALITY STATISTICS

For the information of public health officials and others interested, the data in the following tables have been taken from the monthly mortality reports of State health departments for the latest month for which published records are available. Statistics of most communicable diseases are not included, since they are available in other tabulations in the Public Health Reports. Statistics of deaths from other causes are limited for the most part to those causes which appear in the State reports. In the case of States which publish detailed mortality reports each month, the record of only the principal groups of causes and certain important specific causes have been used.

For purposes of comparison, the mortality records for the corresponding month in a few preceding years have been compiled. The rates have been computed upon the populations as estimated for July 1 of each year represented.

These tabulations will be enlarged as the current data on mortality from additional States become available.

Summaries of annual mortality statistics for 1927 are appended whenever the data are available from the States, and comparisons with several prior years are included when practicable.

Monthly Mortality Statistics

ALABAMA

Death classification, by cause or age	January					
	1928	1927	1926	1928	1927	1926
	White			Colored		
	Annual rate per 1,000					
All causes	10.4	7.9	9.6	14.6	12.6	15.4
	Rate per 1,000 live births					
Infant mortality	80.3	56.8	(1)	126.2	89.6	(1)
	Annual rate per 100,000					
Influenza	89.1	29.9	61.3	80.0	39.5	81.5
Tuberculosis, all forms	58.1	49.6	62.1	136.9	126.3	139.3
Cancer, all forms	46.8	44.5	39.2	41.2	36.8	27.6
Diabetes, mellitus	12.8	5.8	11.1	14.5	5.3	10.5
Cerebral hemorrhage, apoplexy	42.3	46.6	39.9	58.1	71.0	61.8
Diseases of heart	114.7	84.5	93.9	124.8	105.3	153.8
Pneumonia, all forms	167.6	86.0	161.9	191.4	126.3	219.5
Diarrhea and enteritis (under 2 years)	11.3	5.8	11.1	4.8	5.3	7.9
Chronic nephritis	74.7	52.5	61.3	92.1	97.4	107.8
Puerperal state	9.1	11.7	16.3	18.2	15.8	22.3
Congenital malformation and other diseases of early infancy	67.2	62.7	70.2	69.0	52.6	64.4
Automobile accidents	14.3	9.5	11.8	10.9	5.3	9.2
	Number of deaths					
Under 1 year	242	174	207	178	145	166
1 to 4 years	88	55	75	54	47	53
5 to 14 years	57	51	35	42	30	32
15 to 44 years	269	212	245	384	337	384
45 to 64 years	257	206	253	291	226	253
65 years and over	457	377	467	243	177	262
Age not stated	9	6	12	12	7	16

[1] Not available.

Monthly Mortality Statistics—Continued

NEW JERSEY

November

Death classification, by cause or age	1927	1926	1925	1924	1923	1922
	Annual rate per 1,000					
All causes	11.4	11.0	11.6	11.8	11.4	12.4
	Annual rate per 100,000					
Influenza	8.4	10.6	12.2	11.4	4.6	5.8
Tuberculosis, all forms	68.2	71.1	71.3	77.4	82.0	87.7
Cancer	104.5	101.5	105.8	105.7	90.9	95.3
Diseases of the nervous system	110.7	129.6	122.0	139.6	124.6	149.5
Diseases of the circulatory system	254.1	213.9	242.7	215.9	229.7	229.5
Diseases of the respiratory system (pneumonia and tuberculosis excepted)	45.1	52.2	65.9	47.7	58.2	73.1
Pneumonia	48.7	57.9	67.9	58.4	59.6	66.6
Diseases of the digestive system	[1] 65.2	[1] 55.9	[1] 56.4	[1] 66.7	[1] 57.2	[1] 67.3
Infantile diarrhea	16.6	10.6	18.6	27.3	25.2	31.6
Bright's disease	104.8	102.8	89.6	102.6	98.0	108.0
Automobile accidents	33.4	26.4	(2)	(2)	(2)	(2)
	Number of deaths					
Under 1 year	351	358	353	422	408	464
1 to 4 years	112	127	133	152	141	202
5 to 59 years	1,607	1,465	1,536	1,604	1,411	1,446
60 years and over	1,440	1,370	1,396	1,247	1,252	1,200

December

Death classification, by cause or age	1927	1926	1925	1924	1923	1922
	Annual rate per 1,000					
All causes	11.5	13.1	12.3	12.7	11.4	13.7
	Annual rate per 100,000					
Influenza	9.7	15.7	11.8	21.4	11.3	14.1
Tuberculosis, all forms	72.9	84.5	75.9	79.9	76.6	104.2
Cancer	102.7	113.6	114.5	104.0	90.4	96.1
Diseases of the nervous system	123.1	145.3	152.4	132.4	128.5	146.8
Diseases of the circulatory system	256.6	272.9	255.1	234.0	228.5	264.3
Diseases of the respiratory system (pneumonia and tuberculosis excepted)	55.3	76.5	60.5	85.2	62.9	98.2
Pneumonia	61.2	76.8	79.8	83.6	65.3	96.4
Diseases of the digestive system	[1] 57.2	[1] 62.1	[1] 59.9	[1] 69.2	[1] 58.4	[1] 63.4
Infantile diarrhea	9.4	15.4	12.8	16.7	17.2	17.6
Bright's disease	111.5	108.5	109.2	119.7	97.6	109.1
Automobile accidents	31.7	29.4	(2)	(2)	(2)	(2)
	Number of deaths					
Under 1 year	374	436	411	508	406	484
1 to 4 years	114	171	127	171	168	248
5 to 59 years	1,642	1,824	1,662	1,678	1,411	1,635
60 years and over	1,543	1,650	1,574	1,454	1,319	1,523

[1] Infantile diarrhea excepted.
[2] Not available.

Monthly Mortality Statistics—Continued

NEW YORK STATE (EXCLUSIVE OF NEW YORK CITY)

	Death classification, by cause or age	January 1928	January 1927	January 1926	January 1925	January 1924
		Annual rate per 1,000				
1-205	All causes	13.6	14.3	14.8	15.0	14.8
		Rate per 1,000 live births				
	Infant mortality	68	78	78	74	83
		Annual rate per 100,000				
11	Influenza	20.0	27.9	24.9	24.3	17.0
31-37	Tuberculosis, all forms	66.5	84.2	84.9	95.1	84.3
43-49	Cancer and other malignant tumors	127.5	124.7	128.6	139.1	123.1
57	Diabetes mellitus	27.6	27.4	28.4	27.8	30.1
70-86	Diseases of the nervous system and of the organs of special sense	159.1	170.1	184.4	203.3	197.0
74	Cerebral hemorrhage, apoplexy	121.0	127.3	147.8	158.5	148.6
87-96	Diseases of the circulatory system	375.0	372.4	383.5	366.8	326.9
87-90	Diseases of the heart	328.3	322.7	326.1	313.6	277.1
97-107	Diseases of the respiratory system	137.8	167.8	192.7	158.0	156.7
100, 101	Pneumonia (broncho and lobar)	120.4	146.5	164.9	135.8	132.1
108-127	Diseases of the digestive system	69.0	81.2	80.5	83.7	91.1
113	Diarrhea and enteritis (under 2 years)	10.9	11.1	15.1	16.7	20.4
128-142	Nonvenereal diseases of the genito-urinary system	137.4	139.3	123.5	132.6	138.0
128, 129	Nephritis, all forms	121.8	127.7	113.9	116.9	124.1
143-150	The puerperal state	10.9	10.1	12.9	11.6	12.1
151-158	Diseases of the skin and of the bones and organs of locomotion	4.8	3.6	5.0	4.4	7.0
159-163	Malformations and diseases of early infancy	65.2	66.0	74.9	81.3	87.4
165-203	External causes	88.8	76.3	85.3	86.1	98.1
188c	Automobile accidents	17.0	9.4	10.3	7.5	15.3
		Number of deaths				
	Under 1 year	535	607	637	598	695
	1 to 4 years	170	172	165	156	256
	5 to 64 years	2,881	2,857	2,910	2,748	2,641
	65 years and over	2,866	3,040	3,081	2,689	2,492

Monthly Mortality Statistics—Continued

PENNSYLVANIA

	Death classification, by cause	December				
		1927	1926	1925	1924	1923
		Annual rate per 1,000				
1-205	All causes	11.8	12.8	12.9	12.9	12.5
		Rate per 1,000 live births				
	Infant mortality	67.6	80.8	80.6	(1)	(1)
		Annual rate per 100,000 [2]				
11	Influenza	26.6	29.7	29.7	34.9	19.6
31-37	Tuberculosis, all forms	63.3	67.4	77.4	78.1	81.2
43-49	Cancer	100.0	93.7	98.2	85.6	90.6
57	Diabetes	21.5	21.6	20.7	16.7	(1)
74, 83	Apoplexy, softening of brain	97.2	97.8	74.4	(1)	(1)
87-90	Heart disease	239.0	240.0	221.0	(1)	(1)
100-101	Pneumonia, all forms	103.0	151.0	157.0	163.0	147.6
113	Enteritis, under 2 years	16.9	17.6	15.2	25.2	22.8
128-129	Nephritis, all forms	110.0	115.0	114.0	124.0	(1)
143-150	The puerperal state [3]	5.5	5.3	5.1	4.8	(1)
159-163	Congenital malformations and diseases of early infancy [4]	36.1	40.1	40.6	(1)	(1)
188c	Automobile accidents	19.6	18.4	15.1	12.1	16.8

[1] Not available.
[2] Except the puerperal state and diseases of early infancy.
[3] Rate per 1,000 total births.
[4] Rate per 1,000 live births.

Annual Mortality Statistics, 1927

CONNECTICUT, 1923-1927

The following statistics are taken from the Connecticut Health Bulletin of March, 1928, published by the State department of of health:

Mortality in Connecticut in 1927 compared with previous years

Death classification, by cause	1927	1926	1925	1924	1923
	Rate per 1,000				
All causes	10.6	11.8	11.6	11.3	12.0
	Rate per 1,000 live births				
Infant mortality	58.8	71.9	73.0	68.5	76.3
	Rate per 100,000				
Typhoid fever	1.1	1.8	2.5	2.5	2.6
Measles	1.3	12.5	2.5	3.1	16.8
Scarlet fever	1.4	2.2	2.9	3.9	3.6
Whooping cough	2.5	6.1	7.3	5.2	9.0
Diphtheria	5.9	5.3	8.2	11.2	12.7
Influenza	18.8	35.9	26.6	19.2	38.1
Tuberculosis, all forms	66.8	78.2	75.3	81.5	89.3
Pneumonia, all forms	84.8	108.6	109.3	101.8	127.3
Cancer	106.8	106.7	107.6	104.1	98.2
Poliomyelitis	1.0	.4	1.2	1.5	.7
Cerebrospinal meningitis	.6	.6	.8	1.5	3.1
Diarrhea and enteritis (under 2 years)	11.2	16.0	18.6	19.8	21.3
Puerperal state [1]	5.7	6.4	4.9	5.7	5.9
Suicide	12.0	13.9	12.6	10.8	13.3
Accidents	66.8	70.8	72.6	70.6	71.6

[1] Rate per 1,000 living births.

Bulletin No. 7, March 19, 1928, published by the Kansas State Department of Health, comments as follows on the 10 principal causes of death in Kansas in 1927:

Eighteen thousand seven hundred and thirteen deaths were recorded in the State of Kansas during the year 1927, and of that number, 11,251 resulted from 10 diseases, or, as we may term them, the "Ten principal causes of death." Listed in order of their occurrence, they are as follows:

Mortality from 10 principal causes of death in Kansas in 1927

Disease	1927		1926		1925	
	Death rate per 100,000	Rank	Death rate per 100,000	Rank	Death rate per 100,000	Rank
Organic heart disease	143.1	1	131.9	1	116.3	1
Cancer, all forms	100.6	2	91.9	3	84.3	3
Apoplexy	100.2	3	101.1	2	95.7	2
Bright's disease	83.9	4	89.1	4	78.1	4
Pneumonia, all forms	50.9	5	59.1	5	66.0	5
Tuberculosis, all forms	35.3	6	41.0	7	43.0	6
Premature births	30.9	7	32.6	8	32.7	8
Influenza	25.8	8	49.6	6	30.2	9
Diarrhea and enteritis	21.1	9	29.5	9	37.0	7
Senility	20.7	10			20.0	10
Arteriosclerosis			15.7	10		

* * * The 10 principal causes were the same for the three years, except in 1926, arteriosclerosis replaced senility, or old age. * * *

Organic heart disease caused 2,616 deaths, or 14.2 per cent of the total deaths, the rate being 142.3 per 100,000 population. Deaths from heart disease have shown a steady increase from year to year, and this has been especially so the past five years. The comparison from year to year since 1912, the first year for which accurate vital statistics are available, should be interesting:

Mortality from organic heart disease in Kansas

Year	Number of deaths	Rate per 100,000	Per cent of total deaths	Year	Number of deaths	Rate per 100,000	Per cent of total deaths
1912	1,489	89.1	8.6	1925	2,286	126.0	12.2
1917	2,003	115.3	9.5	1926	2,491	136.6	12.9
1922	1,952	108.0	10.3	1927	2,616	142.3	14.2
1924	2,134	116.3	11.9				

It will be noticed that heart-disease deaths have shown a more than 1 per cent increase in 1927 over the year 1926. In 1925, 73 per cent of heart-disease deaths were in the age group 60 to 80 years.

Cancer ranked second with 1,839 deaths, or 9.8 per cent of the total. The rate was exactly 100 per 100,000 population. This is the largest number of deaths and also the highest rate on record in the State. This disease has shown a steady increase in the number of deaths. In both 1925 and 1926, cancer ranked third with 1,529 and 1,674 deaths respectively. In 1912, there were 1,056 deaths or 6.1 per cent of the total. Cancer occurs infrequently prior to 30 years of age, and the great majority of deaths occur after 50.

Apoplexy, with 1,832 deaths, showed a decrease of 9 from the previous year, but an increase of approximately 100 over the year 1925; 9.7 per cent of deaths in 1927 resulted from this disease. The number of deaths, the rate, and the per cent of total deaths, as in the previous diseases listed, are the highest on record.

Bright's disease deaths totaled 1,534, 8.1 per cent of the total, and the rate was 83.4. There were 89 fewer deaths than in the year 1926, and the rate was 5.6 less per 100,000.

Pneumonia deaths totaled 931, the second-lowest number on record, 870 deaths occurring in 1909. The rate, however, was the lowest on record, the difference being readily explained by the greater population in 1927. There were 146 fewer deaths than in 1926 and 265 fewer than in 1925.

Tuberculosis with 645 deaths ranked sixth, the same as in 1925. This disease, however, ranked seventh in 1926. Tuberculosis caused only 3.4 per cent of the total deaths.

Premature births totaled 564, a decrease of 30 from the preceding year, and 31 fewer than in 1925.

Influenza, with 526 deaths, ranked eighth in 1927, sixth in 1926, and ninth in 1925.

MICHIGAN 1922-1927

Michigan Public Health for March, 1928, published by the Michigan State Department of Health, shows the general and infant mortality rates for 1927 for the State. The rates for previous years are shown for purposes of comparison.

Mortality in Michigan in 1927, and comparison with previous years

	1927	1926	1925	1924	1923	1922
	Death rate per 1,000					
All causes	11.5	12.7	11.8	12.2	12.8	11.2
	Rate per 1,000 live births					
Infant mortality	67.8	77.6	75.6	72.2	80.4	74.7

NEW JERSEY

The Public Health News, of January–February, 1928, published by the department of health of the State of New Jersey, makes the following comment on mortality in 1927 in New Jersey:

The New Jersey death rate for 1927 is the lowest in the 50-year records of vital statistics in this State. Provisional figures show that there were 11.43 deaths per thousand population, a slight improvement over the previous low rate of 1921, which was 11.49. Despite the increased population since the State department was organized in 1878, there were fewer deaths from typhoid fever and measles than during any preceding year—typhoid fever, 51; measles, 21. Tuberculosis and cancer show a slightly increased death rate.

The number of deaths of infants under one year per thousand live births was 61. The infant death rate has shown a steadily downward trend; 14 years ago it was exactly double the present rate, and for 1926 the rate was 70, or nine points higher than the rate for 1927.

Unfortunately, a similar decline is not evident in the number of mothers who died during childbirth. The rate this year of 6.1 is an increase over last year's rate of 5.4.

During 1927 approximately 72,800 births were reported, which is a rate of 20 per thousand inhabitants. The total number of births increased 428 over the previous year, but the larger estimated population of the State caused the rate to decline a fourth of a point. The birth rate has declined almost without exception since 1921.

In brief, the year shows the lowest general and infant death rate ever recorded.

NEW YORK STATE (EXCLUSIVE OF NEW YORK CITY) 1923-1927

Since the publication in the Public Health Reports for March 30, 1928, of annual figures from the Health News, the following provisional data are given in the Supplement to the Vital Statistics Review, March, 1928, because they are more complete for New York State (exclusive of New York City).

Mortality in New York State (exclusive of New York City) in 1927 compared with previous years

	Death classification, by cause or age	1927	1926	1925	1924	1923
		Rate per 1,000				
1-205	All causes	12.8	14.0	13.3	13.3	14.8
		Rate per 1,000 live births				
	Infant mortality	64	74	71	71	79
		Rate per 100,000				
11	Influenza	13.8	29.9	14.7	11.0	29.7
31-37	Tuberculosis, all forms	77.3	84.8	88.7	91.4	100.9
43-49	Cancer and other malignant tumors	123.8	122.0	121.2	119.9	123.6
57	Diabetes mellitus	24.4	23.8	22.6	21.4	24.5
70-86	Disease of the nervous system and of the organs of special sense	149.0	165.0	171.5	169.6	183.7
74	Cerebral hemorrhage, apoplexy	112.5	121.2	119.6	130.6	135.2
87-96	Diseases of the circulatory system	332.3	350.5	315.8	301.8	330.6
87-90	Diseases of the heart	286.8	302.8	273.4	261.3	[1] 266.7
97-107	Diseases of the respiratory system	103.5	137.4	117.3	110.5	148.4
100-101	Pneumonia (broncho and lobar)	86.6	113.9	97.7	91.9	121.3
108-127	Diseases of the digestive system	78.5	83.4	90.1	86.7	101.2
113	Diarrhea and enteritis (under 2 years)	13.9	18.5	24.7	21.0	29.1
128-142	Nonvenereal diseases of the genitourinary system	127.2	133.5	121.6	124.8	132.5
128-129	Nephritis (all forms)	124.4	123.8	118.2	111.8	117.3
143-150	The puerperal state	[2] 59.4	[2] 58.7	[2] 59.1	[2] 57.8	13.3
151-158	Diseases of the skin and of the bones and organs of locomotion	4.1	4.8	4.7	5.7	6.5
159-163	Malformation and diseases of early infancy	68.3	73.2	73.7	78.2	87.5
165-203	External causes	103.2	103.3	106.0	104.9	112.2
188c	Automobile accidents	24.8	23.4	21.8	21.2	22.7
		Number of deaths				
	Under 1 year	6,294	7,229	7,209	7,339	8,056
	1-4 years	1,841	2,277	2,151	2,229	2,643
	5-64 years	32,109	33,365	32,008	31,292	31,929
	65 years and over	30,300	32,397	29,317	28,069	29,031

[1] International list, 88-90.
[2] Rate per 10,000 total births (including stillbirths).

PENNSYLVANIA, 1927

The following statistics are taken from the Vital Statistics Bulletin for April, 1928, published by the Pennsylvania State Department of Health:

Mortality in Pennsylvania 1927, compared with preceding years

	Death classification, by cause	1927	1926	1925
		Rate per 1,000		
All causes		11.4	12.5	12.2
		Rate per 1,000 live births		
Infant mortality		70	82	82
		Rate per 100,000 [1]		
1	Typhoid fever	2.7	3.7	4.8
6	Smallpox	0	0	.3
7	Measles	2.5	11.0	5.3
8	Scarlet fever	2.6	2.8	3.6
9	Whooping cough	4.5	9.6	6.8
10	Diphtheria	8.6	8.3	10.3
11	Influenza	24.5	44.0	29.2
16	Dysentery	.5	.8	1.3
22	Anterior poliomyelitis	1.0	.5	.7
23	Encephalitis, epidemic	.9	1.2	1.4
24	Cerebrospinal meningitis, epidemic	.5	.9	.8
31	Tuberculosis, pulmonary	61.1	66.2	65.7
32-37	Tuberculosis, other forms	8.8	10.8	11.2
38, 72, 76	Syphilis, locomotor ataxia, general paralysis of insane	14.2	14.5	14.4
43-49	Cancer	95.3	95.4	91.8
57	Diabetes	19.0	19.6	18.2
66	Alcoholism	5.5	5.0	5.2
74, 83	Apoplexy, softening of brain	86.7	88.7	88.2
87-90	Heart disease	214.0	216.0	198.0
100-101	Pneumonia, all forms	98.1	133.0	126.0
113	Enteritis, under age 2	22.7	31.5	42.0
122	Cirrhosis of liver	9.0	8.9	8.9
128-129	Nephritis, all forms	102.0	107.0	104.0
146	Puerperal septicæmia [2]	2.3	2.4	2.6
143-145, 147-150	Puerperal, other forms [2]	3.8	3.7	3.5
159	Congenital malformations [3]	7.9	7.8	8.3
160-163	Diseases of early infancy [3]	26.9	27.8	27.7
165-174	Suicide	12.1	12.4	10.5
178	Conflagration	1.3	1.5	1.0
182	Drowning	4.4	4.4	4.7
186	Mine and quarry accidents	9.2	9.6	8.1
188A	Railroad accidents	7.6	8.0	8.2
188C	Automobile accidents	19.3	18.0	16.6
193	Excessive cold	.4	.3	.2
194	Excessive heat	1.4	.8	3.2
197-199	Homicide	5.6	5.5	6.0
197-199	All other causes	209.0	223.0	228.0

[1] Except the puerperal state and diseases of early infancy.
[2] Rate per 1,000 total births.
[3] Rate per 1,000 live births.

The 1927 rates both for births and deaths are the lowest ever recorded in Pennsylvania, and the death rates for a number of the more important causes of death have also established new low records. The only important high record set in 1927 was for automobile deaths on the basis of 100,000 population, but when the automobile death rate is computed on the basis of 1,000 registered motor vehicles in the State, even this becomes a new low record of 1.1 as compared with 1.2 in 1925 and 1926.

The 1927 birth rate as given in the table is the same as in 1926; but if the computation were carried out one more decimal place it would be slightly lower than in 1926, which was the previous low record. But the general death rate, and particularly the infant death rate, shows such a remarkable drop that the population increase in 1927 from the excess of births over deaths was well above the average of the past 22 years.

The low death rate of 11.4 per 1,000 inhabitants, was due largely to the relatively low prevalence of disease of the respiratory system. The decrease in deaths from pneumonia and influenza alone account for 55 per cent of the total reduction in the deaths as compared with 1926. The death rate from pneumonia was only 98.1 per 100,000 population, as compared with a previous low record of 128 in 1925. Tuberculosis also shows a new low record, both for pulmonary tuberculosis and for other forms of the disease. The rate of 69.9 per 100,000 for all forms of tuberculosis may be compared with the rate of 150.9 in 1906. In these 22 years tuberculosis has declined from the first to the sixth cause of death.

Typhoid fever, with a new low rate of 2.7 per 100,000, is no longer an important factor in the mortality statistics of Pennsylvania. Smallpox, once the terror of mankind, has claimed no victims in Pennsylvania in more than two years. Measles shows a low death rate in 1927; but this disease comes in cycles, so it may be expected to return in 1929. Scarlet fever and whooping cough also will probably return again as they have in the past after years of light incidence. Diphtheria was the only one of the acute infections of childhood to show an increase in 1927 over 1926, but this increase was slight and came after five successive years in which new low records for diphtheria deaths were established.

For the diseases of advanced years the record of 1927 was not so good. Heart disease, now the leading cause of death, dropped very slightly from the high record of 1926. Likewise the death rates for cancer and diabetes were exceeded only by those of 1926. For nephritis and cerebral hemorrhage the death rates were above the average of 22 years.

The maternal mortality rate still stands at 6.1 per 1,000 total births. This rate is the same as for 1926 and 1925, and is but slightly below the average of the preceding 21 years. Likewise the death rates from violent causes show little change. There was a slight decrease in the rates for accidents on railroads and in mines and quarries, but these decreases were offset by increases in automobile deaths and accidents of other sorts. The rates for homicides, suicide, and accidental drowning show no material changes.

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WISCONSIN 1920–1927

The October-December, 1927, State Board of Health Bulletin of Wisconsin, publishes the following statistics for Wisconsin for 1927 and comparison with previous years:

Mortality in Wisconsin in 1920–1927

Death classification, by cause or age	1927	1926	1925	1924	1923	1922	1921	1920
	Rate per 1,000							
All causes	10.3	10.6	10.5	10.2	10.7	10.0	10.1	11.1
	Rate per 100,000							
Typhoid fever	1.4	1.4	2.0	1.0	2.2	3.0	2.9	2.6
Smallpox	.2	.03	4.5	.4	.07	.07	.6	.3
Measles	8.3	5.0	2.2	2.6	7.1	1.6	1.5	8.3
Scarlet fever	2.1	2.6	3.7	7.3	8.7	6.3	8.9	9.5
Whooping cough	2.5	5.5	4.0	4.6	5.9	3.7	6.1	11.1
Diphtheria	4.4	5.4	6.1	7.3	13.0	9.1	14.8	14.3
Influenza	20.4	35.6	31.8	15.1	39.0	22.5	7.6	79.6
Erysipelas	3.1	2.8	2.3	2.9	3.1	2.5	3.6	3.3
Tuberculosis, all forms	59.8	64.8	61.0	62.9	65.8	69.6	74.9	84.7
Cancer	101.0	106.4	103.4	98.9	91.6	92.3	96.7	87.8
Meningitis	4.0	4.0	3.8	4.0	4.5	4.6	4.6	5.7
Pneumonia, all forms	64.8	82.5	88.7	89.4	106.3	90.5	107.8	109.6
Diarrhea (under 2 years)	13.8	15.1	20.1	14.6	18.6	18.5	28.3	24.4
Puerperal septicemia	2.3	3.5	2.5	4.5	4.5	3.7	4.5	4.6
Suicide	12.7	13.6	13.2	13.1	11.3	11.2	13.2	10.0
Accidental deaths	62.7	60.0	59.8	55.9	54.5	51.5	50.8	47.9
Automobile accidents	20.3	14.9	13.0	11.9	9.1	8.7	7.6	5.3
Homicide	2.2	2.3	2.1	1.6	2.2	1.8	2.1	1.5
	Number of deaths							
Under 1 year	3,356	3,799	3,728	3,689	4,059	4,043	4,381	4,267
1–4 years	762	922	956	857	1,142	927	1,103	1,377
5–64 years	12,858	12,997	12,919	12,498	12,781	11,839	12,048	13,956
65 years and over	12,264	12,106	11,284	10,741	10,962	10,280	9,762	9,837

THE PRACTICAL APPLICATION OF TWO QUALITATIVE TESTS FOR HCN IN SHIP FUMIGATION

By G. C. Sherrard, *Acting Assistant Surgeon, United States Public Health Service*

This investigation was undertaken with the idea of establishing a simple chemical test for the detection of HCN in practical ship fumigation, first, as an aid in determining when a vessel is safe for habitation of its crew and workers after the fumigation procedure is completed, and, second, to establish the earliest moment when it would be safe for members of a fumigating crew to enter a hold or compartment of a vessel for the purpose of further ventilation and to search for rats.

As a criterion for these tests the following basic principles were laid down to which a chemical test should conform in order to be of practical value:

1. The test should be definite under all conditions, at or above the predetermined danger point to human life.

2. It should be such as can be applied without attendant danger to those making it.

3. The time factor of its reaction should be slow enough to permit of accurate computation with an ordinary watch in the hands of the usual personnel engaged in this work.

4. The test should be efficient within at least a 10 per cent of error as to time.

5. The varying atmospheric conditions at seaports should not materially affect the application of the test.

Both tests herein described depend upon change in color of filter paper which has been previously immersed in certain solutions.

BENZIDINE COPPER ACETATE

This test is certain proof of the presence of hydrocyanic acid gas in the air in all cases where no disturbing constituents can come into question (oxidizing gases such as chlorine and nitric acid) and is completed by dipping a strip of filter paper in a solution of benzidine and copper acetate and exposing the moist paper to the air of the compartment to be tested. In the presence of HCN the filter paper turns blue in periods varying from three to thirty seconds, depending upon the concentration of HCN. The test was originated by Sieverts and Hemsdorf and consists of two solutions, as follows:

(1) 2.86 gms copper acetate per liter of water.

(2) 475 c. c. saturated benzidine acetate solution with 525 c. c. of water.

Mix equal parts of (1) and (2) just before using. Slips of filter paper are dipped into this reagent and taken into the compartment to be tested in closed tubes. Upon exposure the paper will show from a very faint to an intense blue, indicating from 20 mgs. to 80 mgs. HCN per cubic meter.

A large number of tests were made with reagents, using many variations of the original formula. The most satisfactory was found to be that in which the original solutions were both diluted with equal parts of water. This gave a pale blue color on 10 seconds' exposure to 2.8 grams HCN per 1,000 cubic feet of air space. This modification of the original test was used in testing the holds and compartments of vessels during routine fumigation, and when used by those familiar with the test through laboratory experience it was found to be about 75 per cent efficient as compared with the results obtained in the usual method, that is, through the sense of smell, taste, and the exposure of white rats.

The benzidine copper acetate test requires that the test papers be read for a change in color after an exposure of from 7 to 10 seconds, which necessitates entering the compartment or hold before making the test (a procedure not without danger). An error of three seconds in reading the time factor would mean an error of 30 per cent or greater in the efficiency of the test. The results must be read while

the color is rapidly changing and the operator is in the presence of HCN. The color changes, in widely varying concentrations of HCN, are so slight that it requires considerable laboratory experience with known concentrations of HCN in order to make accurate determinations.

METHYL ORANGE-MERCURIC CHLORIDE MIXTURE

This test depends for its perception on a change of color of No. 40 Whatman filter paper which has been immersed in a mixture of methyl orange and mercuric chloride solutions, to which has been added a specified amount of glycerine, and then drained and hung up to dry. This paper, which is an orange color, turns pink upon exposure to HCN gas.

Experiments with this reagent were begun by using a concentration of solutions as specified by chemists of the R. & H. Chemical Co., which is as follows:

Solution No. 1. Mercuric chloride gms. 5 dissolved in 250 c. c. distilled water.
Solution No. 2. Methyl orange gms. 2.5 dissolved in 250 c. c. distilled water.

These solutions are mixed in the proportion of two parts mercuric chloride and one part methyl orange, and to the mixture is added 0.5 c. c. glycerine for every 15 c. c. of the mixture. The sheets of filter paper are immersed in this solution and hung up to dry in air which is free from any trace of acid, and when dry they are cut in strips ¼ inch wide and preserved in glass tubes protected from the light.

In conducting these tests a fairly gas-tight room containing 1,267 cubic feet of air space was used, having two outside windows which permitted the admittance of outside air so that the relative humidity of the room was approximately that of the outside. No artificial heat was used. Before being used, the filter papers were exposed to the outside air for a period of two hours or more with an approximate relative humidity of 74 per cent. The HCN was introduced in the liquid form containing 20 per cent CNCl which, being previously measured, was distributed in shallow glass dishes at various points in the room, and 10 minutes were allowed to elapse for complete diffusion before beginning the tests.

In order to determine the exact length of exposure necessary to complete the reactions, the writer remained in the test compartment, wearing a gas mask, when the concentration was 2.8 grams per 1,000 cubic feet or over, and without a mask when a lesser quantity of HCN was used. Two glass tubes, each containing a strip of the paper to be tested, were taken into the test room, one being opened after the 10-minute diffusion period and the paper exposed to the HCN, the other vial being kept stoppered for comparison. This method enabled the operator to make notes as to the time of the color changes during the test.

As previous experiments with white rats had established the fact that 3.35 grams of HCN per 1,000 cubic feet of air space was the mini-

mum lethal dose in a gas-tight compartment in an exposure of 12 hours, this concentration was taken as that in which a chemical test should give a definite reaction.

As the original test gave a reaction in 30 seconds, which was too fast for practical purposes in ship fumigation, a systemic series of tests was undertaken with lesser concentrations of the solutions, first diluting all reagents equally and then each reagent separately. Following this procedure a dilution of one-fourth the original concentration for methyl orange and mercuric chloride with double the original quantity of glycerine proved to give the most satisfactory results. This amended formula is given below, and the combined results of repeated tests are shown in the table.

Solution No. 1. Mercuric chloride, gms. 1.25; distilled water, c. c. 250.

Solution No. 2. Methyl orange, gms. 0.60; distilled water, c. c. 250.

Mix 10 c. c. of solution No. 1 with 5 c. c. of solution No. 2 and add 1 c. c. of glycerine.

Grams HCN per 1,000 cubic feet	Proportion of standard [1]	Duration of test in minutes				
		½	1	1½	2	3
6.7	1/10	Slight pink at edge	Faint pink	Definite pink	Red	Red.
3.35	1/20	No change	Slight pink at edge	Faint pink	Definite pink	Do.
1.675	1/40	do	No change	Brownish orange	Faint pink	Faint pink.
.8375	1/80	do	do	No change	Slight pink	Very faint pink.
.4187	1/160	do	do	do	No change	No change.
.2093	1/320	do	do	do	do	Do.

[1] The word "standard" indicates 2 ounces HCN per 1,000 cubic feet air space.

A study of this table shows that there is an approximate ratio between the concentration of HCN and the time of exposure. Two minutes' exposure to 1.67 grams of HCN per 1,000 cubic feet of air gives the same reaction as 1½ minutes' exposure to 3.35 grams, and a 1-minute exposure to 6.7 grams of HCN. It will also be seen that the minimum lethal concentration for white rats, namely, 3.35 grams per 1,000 cubic feet, is the lowest that produces a definite pink color within 2 minutes and that one-fourth that concentration (0.84 gram per 1,000 cubic feet) is the lowest concentration producing any change. In 2 minutes, 6.7 grams per 1,000 cubic feet, which is one-tenth the usual fumigation concentration, produces a distinct red.

From the test room in the laboratory the field of operations was transferred to vessels undergoing routine fumigation in New York Harbor, and a comparison was made with the live white rats which are used in testing holds. By means of a paper clip and string (a fishing line and reel is excellent), strips of the test paper were lowered into the holds for a 2-minute exposure, and upon withdrawal

of the paper, white rats were immediately lowered into the hold in an open cage and in the same locality in which the test paper had been exposed. A series of 55 comparative tests were made on 10 vessels. In 42 of the tests in which the test papers did not show a definite pink in 2 minutes, the white rats gave no symptoms of HCN poisoning in the 10-minute exposure period. In 10 of 13 tests in which the papers turned a definite pink in 2 minutes, the white rats showed the effect of HCN by agitation or prostration in from 1 to 5 minutes. In three tests in which the paper turned pink within the 2-minute exposure, the rats did not become agitated or exhibit signs of HCN poisoning in 10 minutes' exposure. These three tests were performed during a light mist, and excessive moisture probably accelerated the reaction of the test papers. Following all negative tests the holds were immediately entered by members of the fumigating crew in the usual manner and in no case was excessive concentration of gas encountered.

As most of the tests undertaken in these experiments were made from the practical standpoint, and considerable variation had been noted between various reagents, in filter papers, and in the moisture content of the papers, it was believed advisable to have the work checked by experienced chemists. Through the courtesy of Mr. L. M. White, of the Roessler & Hasslacher Chemical Co., two of the company's expert chemists, Mr. F. S. Pratt and Mr. Mark Walker, undertook, in the California laboratory of the company, to check the work and elaborate certain details. The result of this detailed check by experienced chemical research workers confirmed the writer's work as outlined, and in addition showed that 1 cubic centimeter of glycerin in the solution gave better constant results than the 0.5 cubic centimeter previously used. It also emphasized the importance of humidifying the test papers to a moisture content of between 7 and 8 per cent and maintaining them at this point until used. The effects of chloro-picrin, which in small amounts is an ingredient of zyklon–B, was tested by these same chemists and it was shown that a rather high concentration of 0.02 per cent of this gas, by weight in the air, did not affect the test paper upon exposure for six minutes to the gas.

SUMMARY

Two chemical tests for the detection of HCN were given practical trials in the fumigation of vessels and in the laboratory. One of these, the benzidine copper acetate test, is too rapid and too sensitive for practical purposes. The other, the methyl orange-mercuric chloride test has been modified to meet fumigating conditions.

The methyl orange-mercuric chloride test is very much slower than the benzidine copper acetate test and is sensitive to a concentration very much lower than the minimum lethal concentration of HCN.

It requires two minutes to complete its reaction, which allows for an error of a few seconds in reading the time factor without materially affecting the calculations. It is made with a comparatively dry filter paper which can be prepared in advance at a convenient place and which will keep under proper conditions of humidity for 30 days. The test can be accomplished by lowering a strip of the test paper into a hold by means of a clip and string, thus avoiding danger to the operator through exposure to HCN gas. The only apparatus necessary is a string and clip, a dark container with a supply of test papers, and two small glass vials, one carrying the immediate supply of test paper and one containing a single test paper for comparison. When desirable the test paper can be carried into a room or compartment in a small vial and then exposed for the desired length of time. In this test a 10 per cent error in noting the time of exposure would not materially affect the resultant conclusions.

Chloro-picrin reacting slowly with the test paper will not interfere with the practical operation of the test when fumigants containing this ingredient are used.

As the time exposure necessary to produce a reaction is shortened as the humidity increases, and vice versa, too much credence should not be placed in this test if used during rain or fog; otherwise a definite pink color at the end of two minutes' exposure indicates a dangerous concentration of HCN gas in the air.

It is apparent that this test depends upon a judgment of color for its accuracy, and considerable laboratory care is essential in preparing and maintaining the test papers at a fairly constant moisture content. For these reasons it is not believed that the test can completely replace the tests of smell, taste, and lachrymation as now used. (Under laboratory conditions, working with known quantities of HCN, it was established that the sense of smell could detect 0.25 cubic centimeter of liquid HCN per 1,000 cubic feet of air space, or approximately $\frac{1}{280}$ of the standard concentration used in ship fumigation.) However, this test is of value and can replace the use of white rats for testing holds, and, in conjunction with the sense of smell, taste, and lachrymation, is valuable as a further aid of safety in the final clearing of a vessel. Owing to the fairly high atmospheric humidity at most seaports an error in this test will probably be on the side of safety, which would result only in a slight delay in the clearing of vessels.

Practical work at the New York Quarantine Station has shown that test papers under atmospheric conditions of between 70 and 75 per cent relative humidity, and preserved in tightly stoppered bottles with air of the same humidity, will give good practical results for a period of two weeks. Under these conditions a majority of the quarantine stations should be able to prepare their own test paper

by using the wet and dry bulb method of ascertaining humidity or consulting the local United States Weather Bureau for data.

This test is of value and has been used at the New York Quarantine Station for the detection of leaking gas containers in storerooms and to establish the source of leakage from compartments undergoing fumigations.

DEATH RATES IN A GROUP OF INSURED PERSONS

Rates for Principal Causes of Death, February, 1928

The accompanying table is taken from the Statistical Bulletin for March, 1928, issued by the Metropolitan Life Insurance Co., and presents the mortality experience of the industrial insurance department of the company, by principal causes of death, for February, 1928, as compared with January and with February, 1927. The rates are based on a strength of approximately 18,000,000 insured persons in the United States and Canada.

A new low death rate for the month of February was established this year for this group of persons, the rate this year being 9.4 per 1,000 as compared with 9.6, which was recorded in both 1927 and 1921.

The Bulletin states:

The most important single factor in reducing last month's death rate to this new minimum was a drop in the mortality from tuberculosis to 89.5 per 100,000, as compared with 99.7 during the same month of 1927. Early indications point to a considerable reduction, for the year as a whole, from the previous minimal figure for tuberculosis which was established only last year. The year-to-date tuberculosis death rate among these policyholders for the first 12 weeks of 1928 was only 90.5 per 100,000, as compared with 97.7 for the same weeks of 1927. It should be borne in mind that the season of highest mortality from tuberculosis extends from January to May. If, therefore, the reduced death rate continues during March, April, and May, the end of 1928 will be almost sure to be signalized by still another new low record in the mortality from tuberculous disease.

Other diseases and causes of death to show improved mortality records over February of last year are typhoid fever, measles, scarlet fever, whooping cough, influenza, Bright's disease, conditions incidental to pregnancy and childbirth, suicide, and homicide.

On the other hand, the death rate in February was higher than last year for diphtheria, organic heart disease, and automobile fatalities. The rise in the diphtheria rate follows an increase in January over last year's figure for that month, and points strongly to a further rise in the diphtheria death rate this year. January and February are two of the months in which the diphtheria death rate runs much above the average.

The course of the automobile-accident death rate has been steadily upward for two decades, but no previous year has begun as badly as has 1928. Following a January death rate that had never been even approached by any previous figure for that month, no less than 228 policyholders were killed by automobiles in February, with a death rate of 15.8 per 100,000, which is higher by 37.4 per cent than the previous February maximum of 11.5 per 100,000, as recorded only last year.

Death rates (annual basis) for principal causes per 100,000, February, 1928, as compared with January and with February, 1927

[Industrial insurance department, Metropolitan Life Insurance Co.]

Causes of death	Death rate per 100,000 lives exposed [1]			
	February, 1928	January, 1928	February, 1927	Year, 1927 [2]
Total, all causes	943.5	944.9	956.6	885.4
Typhoid fever	1.7	1.8	3.1	4.6
Measles	4.2	3.8	5.5	4.1
Scarlet fever	4.4	3.6	5.2	3.1
Whooping cough	4.1	4.3	5.3	6.4
Diphtheria	12.6	14.8	11.3	10.5
Influenza	25.6	25.4	30.0	17.7
Tuberculosis (all forms)	89.5	84.8	90.7	93.3
Tuberculosis of respiratory system	78.6	74.2	88.5	81.7
Cancer	76.3	74.3	75.5	74.0
Diabetes mellitus	18.6	19.0	18.9	16.7
Cerebral hemorrhage	57.9	59.4	57.1	54.9
Organic diseases of heart	149.4	150.7	136.7	132.2
Pneumonia (all forms)	117.4	111.2	118.0	77.6
Other respiratory diseases	18.2	18.9	18.6	15.4
Diarrhea and enteritis	14.0	13.0	14.3	24.5
Bright's disease (chronic nephritis)	75.5	79.4	80.2	69.3
Puerperal state	13.3	13.7	14.9	15.4
Suicides	7.0	7.4	7.8	8.3
Homicides	5.6	6.2	7.2	7.2
Other external causes (excluding suicides and homicides)	55.6	62.4	54.0	63.7
Traumatism by automobiles	15.8	16.1	11.5	18.3
All other causes	192.6	190.9	193.5	186.7

[1] All figures include infants insured under 1 year of age.
[2] Based on provisional estimate of lives exposed to risk in 1927.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Presumption of violation of antinarcotic act because of absence of appropriate tax-paid stamps.—(United States Supreme Court; Casey *v.* United States; decided April 9, 1928.) The petitioner was convicted of violating the Harrison Antinarcotic Act, the charge being that he had purchased morphine, not in or from the original stamped package, at Seattle, within the jurisdiction of the court. The conviction was sustained by the circuit court of appeals. There was no testimony directly concerning the purchase, and the Government relied in part at least upon the presumption of a violation, created by section 1 of the antinarcotic act (act of December 17, 1914, 38 Stat. 785, as amended by the act of February 24, 1919, 40 Stat. 1130). The amended section 1 made the purchase, sale, etc., of narcotic drugs unlawful except in or from the original stamped package, and the absence of the required stamps from any of the said drugs "shall be prima facie evidence of a violation of this section by the person in whose possession same may be found." The petitioner argued that the presumption thus created did not and, consistently with the sixth amendment to the Federal Constitution, could not extend so far as to show a purchase within the district and thus bring the case within the jurisdiction of the trial court. The conviction, however, was affirmed by the Supreme Court, which said:

* * * But we are of opinion that upon the facts of this case the court was right. If the jury believed that the defendant, long established in Seattle, said

that he had not the drug but would, and shortly thereafter did, furnish it, the inference that he bought it in Seattle is strong, and it is reasonable to suppose that if attention had been called to the point the inference could have been made stronger still. * * *

With regard to the presumption of the purchase of a thing manifestly not produced by the possessor, there is a "rational connection between the fact proved and the ultimate fact presumed." (Luria *v.* United States, 231 U. S. 9, 25; Yee Hem *v.* United States, 268 U. S. 178, 183.) Furthermore there are presumptions that are not evidence in a proper sense but simply regulations of the burden of proof. (Greer *v.* United States, 245 U. S. 559.) The statute here talks of prima facie evidence, but it means only that the burden shall be upon the party found in possession to explain and justify it when accused of the crime that the statute creates. (4 Wigmore, Evidence, sec. 2494.) It is consistent with all the constitutional protections of accused men to throw on them the burden of proving facts peculiarly within their knowledge and hidden from discovery by the Government. (4 Wigmore, Evidence, sec. 2486.) In dealing with a poison not commonly used except upon a doctor's prescription easily proved, or for a debauch only possible by a breach of law, it seems reasonable to call on a person possessing it in a form that warrants suspicion to show that he obtained it in a mode permitted by the law. * * *

Garbage ordinance upheld.—(California Third District Court of Appeal; Ex parte Santos, 264 P. 281; decided January 28, 1928.) The petitioner had been convicted of unlawfully transporting garbage through the streets of the city of Sacramento in violation of a city ordinance. He sought his discharge by habeas corpus proceedings, alleging that section 1 of said ordinance was unconstitutional in that it deprived a private person of his property without due process of law. The ordinance, which regulated the collection and removal of garbage, provided, among other things, for the disposal of garbage and its transportation through the streets of the city only by duly authorized persons, and contained in section 1 the following definition:

Garbage, as the said word is made use of in this ordinance, consists of dead animals, of not more than 10 pounds weight each, and of every accumulation of animal, vegetable, and other matter that attend the preparation, consumption, decay or dealing in, or storage of, meats, fish, fowls, birds, fruits, or vegetables. The term "garbage" does not include dish water or waste water.

In denying the writ of habeas corpus, the district court of appeal stated:

We need consider only section 1 of the act in question, as all the other provisions are merely regulatory. * * *

All the authorities agree that the preservation of health of the inhabitants is one of the most important purposes of municipal governments. And the police power in this respect is coextensive with the necessities of the situation. That the collection and removal of garbage is one of these necessities requires no argument. Its disposal within a very limited period of time is of prime importance. Whether it is disposed of by cremation or by other methods is wholly immaterial. Its collection, transportation and removal from the limits of the

municipality are the fundamental purposes for the exercise of the police power regulating and requiring the same in order to protect the public health.

That the garbage in question may have some value as food for hogs does not in any wise limit the police power of municipalities. * * *

* * * In every city there is more or less ignorance, more or less willful disregard of all health laws, and much avarice which renders police regulations, such as we are here considering, absolutely indispensable, against which the so-called property right must yield to the general good. That such ordinances are not unconstitutional as violating any property rights is distinctly held by the United States Supreme Court in the case of California Reduction Co. *v.* Sanitary Reduction Co. (199 U. S. 306, 26 S. Ct. 100, 50 L. Ed. 204) and Gardner *v.* Michigan (199 U. S. 325, 26 S. Ct. 106, 50 L. Ed. 212).

* * * We find no modern authority which would justify our holding that section 1 of ordinance No. 146, fourth series, of the city of Sacramento, is invalid either as invading any property right or for any other reason suggested upon this hearing.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Sanitary Engineering Progress in the Middle West.—Wynkoop Kiersted. Proceedings Tenth Texas Water Works Short School, January, 1928. (Abstract by Jane H. Rider.)

The author reviews the changes in engineering practice which have occurred in the Middle West. He advocates the use of gumbo for a waterproofing material and describes the impounding reservoir constructed at Council Bluffs in 1882. The upstream face of the dam and the settling basins were lined with gumbo from the Missouri River bottoms, over which bricks were laid on edge in a 2-inch cushion of sand. After being in use 25–30 years, borings made into these linings showed the gumbo to be 18–28 inches thick. The courses of brick lining the dam were fairly straight, but those in the settling basin had been somewhat disarranged and had been patched with concrete.

Gumbo can also be used to fill the joints between concrete slabs, as an expansion joint in joining some types of concrete walls, and for packing the annular space around cast-iron pipe where it passes through a concrete wall.

Sedimentation and sterilization show the most marked improvements in water purification. The Kansas City water supply is given as an example that safe, potable water can be produced by sedimentation and chlorination alone. Filtration is entirely dependent upon the efficiency of settling basins. Changes in methods of sedimentation are described.

Sewage must be prepared for filtration or land treatment with the same thoroughness with which water is prepared for filtration. It is difficult to combine sedimentation, which is mechanical, with sludge digestion, which is biological, without mutual interference. The more thoroughly suspended solids are removed from sewage, the more easily it may be purified by natural processes on trickling filters or land without becoming offensive Solids should be caught in a preliminary basin and conveyed to a separate tank for digestion. Only organic matter in solution should be allowed on filters or applied to the land.

The Legislation of 1927 in Relation to Municipal Engineering.—J. B. R. Conder. *The Surveyor* (British), vol. 73, No. 1879, January 27, 1928, pp. 137–138. (Abstract by H. W. Streeter.)

Two (British) legislative acts, included under those of 1927, though passed in December, 1926, of special interest to sanitarians, were the housing (rural workers) act and the public health (smoke abatement) act. The former is designed to

promote the provision and improvement of housing accommodation for agricultural workers and persons of like economic status. It provides for the submission to the Minister of Health of schemes for reconstructing and improving houses or buildings and for subsidies or loans in respect to approved schemes, where the estimated cost of the dwelling, after execution of the proposed works, does not exceed £400, or the estimated cost of the works is less than £50 (or where the works will constitute an improvement to two or more dwellings for the provision of water, drainage, or other works for a joint benefit not less than £100).

The public health (smoke abatement) act extends the provisions of an act of 1875 relating to smoke nuisances. A chimney (other than that of a private dwelling) sending forth smoke in such quantity as to be a nuisance, is liable to be dealt with summarily, whether or not the smoke is black, the term "smoke" including soot, ash, grit, and gritty particles. The act also provides that the powers of an urban authority under the act of 1875 and of the London County Council are to extend to the making of by-laws requiring the provision of smoke prevention or reduction devices in new buildngs not private dwellings. The act became operative July 1, 1927.

Moscow Sewage Disposal.[1] Anon. *The Surveyor*, vol. 73, No. 1876, January 6, 1928, p. 2.

"The fifth report of the commission appointed to investigate the question of the disposal of the sewage of Moscow describes the method of disposal by land treatment which has been in operation since 1914. Separate sections are devoted to the engineering, agricultural, and chemical sides of the subject, and details are given of the results obtained on one of the two large farms used for the purpose.

"The area available for irrigation is about 2,000 acres, of which about 1,509 acres were in use in 1924. The soil is sand and clayey sand, and the area is divided into sections of 1 to 4 acres, to which the sewage is conveyed in the usual manner, by brick and earthen channels. Subdrains are arranged at a depth of 5 to 6 feet, and 35 feet apart. Various kinds of crops are cultivated, but the best results are obtained with hemp. This crop produces two to three times as much as under ordinary cultivation, and does not reduce the volume of sewage that can be treated per acre. The area occupied by this crop can be irrigated for 11 months in the year, as the work of cultivation does not take more than 4 weeks, and weeds are prevented from growing, as they are choked by the hemp.

"In spite of the fact that the river into which the final effluent is discharged has a flow of practically the same volume as the sewage effluent, the purification of the sewage is so satisfactory that the river water is not adversely affected."

Separate Sludge Digestion at Antigo, Wis. Anthony J. Fischer. Proceedings Tenth Texas Water Works Short School, January, 1928. (Abstract by Jane H. Rider.)

This plant consists of a two-section grit chamber, a bar screen, a clarifier with Dorr mechanism, a Dorrco pressure pump, a sludge digestion tank with heating coils and a Dorr digester mechanism, four sludge drying beds, a wet well, two siphon chambers, and two trickling filters. It was designed for an ultimate flow of 900,000 gallons per day and a contributing population of 10,000. The filter effluent discharges into a small creek of low flow.

The plant began operating in December, 1926. No ripe sludge was available for seeding, and so 5 feet of raw sewage was run into the digestion tank and the heating system was started. Raw sludge was then pumped into the tank daily. It was necessary to add milk of lime the first three months to adjust

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[1] See also PUBLIC HEALTH REPORTS for Apr. 13, 1928, pp. 886 and 887.

the pH value; a sludge circulation system prevented the formation of a lime sludge at the bottom of the tank.

After 8 months' operation there was 4 feet of well-digested sludge in the tank averaging 8.9 per cent solids and 55.5 per cent ash. The supernatant liquid was clear and there was no scum. Fifty-nine per cent of raw solids are digested, giving an average of 11.5 cubic feet of gas per pound of volatile matter added. About 0.8 cubic foot of gas per capita per day is produced, which is burned under a Bryant boiler to heat the water used in the heating coils. Difficulties with gas collection were overcome by using a high separate seal dome, a well-insulated gas pipe, and a small gas holder.

Cyanide Waste Poured into Stream Poisons Livestock. A. H. Wieters. *Water Works Engineering*, vol. 81, No. 4, February 15, 1928, p. 204. (Abstract by H. E. Miller.)

Cattle died soon after drinking water from a small stream into which was discharged the effluent from an Imhoff tank of an intermittent sand filter disposal plant. Investigation disclosed that on this particular day a 600-gallon vat of electrolyte, which, among other salts, contained 2 pounds of sodium cyanide per gallon, had been dumped into the sewer by mistake. The question arises as to what effect small amounts of this substance will have upon the bacterial flora of sewage disposal systems.

Hydrants for Coach Yards and General Service and Methods for Supplying Water to Coaches. Report of the Committee on Water Service, A. R. E. A. *Railway Age*, vol. 84, No. 9B, March 7, 1928, pp. 560–D65–66. (Abstract by A. L. Dopmeyer.)

The report of the committee was divided into the following three sections: (1) Hydrants for coach yards and passenger station platforms where coaches are watered; (2) methods of supplying water to coaches from hydrants, including care and handling of hose, nozzles, and connections; (3) hydrants for general service such as ash pits, stock yards, small stations, and similar facilities.

Under the first section, the committee obtained information from representative railroads in all parts of the United States and the features of what are believed to be the most satisfactory type of hydrants for this purpose are listed in this article. It is concluded that the most suitable type of hydrants for this purpose is a quick-opening, self-draining, nonfreezing valve in a pit or box flush with the surface.

Under the second section it was concluded that the method of conveying drinking water from hydrants to coaches is satisfactory in practically every respect except the important one of sanitation, and that no method of protecting nozzles and hose ends yet devised has proved entirely satisfactory.

Under the third section, it was stated that some type of high top hydrant is preferred, which should be rugged in construction and have no parts which can be easily damaged or removed.

Sodium Aluminate as an Aid to Water Softening. Report of the Committee on Water Service, A. R. E. A. *Railway Age*, vol. 84, No. 9B March 7, 1928, pp. 560–D64–D65. (Abstract by A. L. Dopmeyer.)

In the addition of from 1 to 3 grains per gallon of aluminum or ferreous sulphate in the lime-soda treating process, it has been found that the aluminum hydrate or ferreous hydrate formed in the reaction weighs down the light particles of magnesium hydrate and causes them to settle more quickly, and also acts to free the softened water from the grain or so of calcium or magnesium carbonate, which is slow to come out of solution and causes "after-precipitation" and scale in the pipe lines.

However, if sodium aluminate is used instead of ferreous or aluminum sulphate, the results are usually found to be more speedy and complete. About 1½ grains of sodium aluminate per gallon of water are used.

Chlorination of Water Supplies in Assam. R. T. Sen. Proc. Assam Branch Brit. Med. Assoc. Annual Meeting, Silchar, March 1 and 2, 1926, pages 43–45. Abstract by Guy T. P. Tatham in *Bulletin of Hygiene*, vol. 2, No. 8, August, 1927, p. 649.

"Chlorination of the Sylhet water was started in July, 1922. Results were unsatisfactory at first and this was ascribed to improper dosage. With experience the defects were remedied, the total count was low and except for one occasion in February, 1925, lactose fermenters were absent from 20 c. c. In Silchar, chlorination was begun in May, 1924, and the results obtained were good from the start. Tables are given showing the bacterial improvement in the water supplied as compared with prechlorination figures. The author calls attention to certain disadvantages and difficulties in the use of chlorine to purify a water supply, viz, the unpleasant taste of free chlorine in the water, its possible injurious physiological effects, and the action on the water mains, also to the necessity for allowing adequate time of contact for the chlorine to exert its sterilizing effect. (If adequate time of contact is allowed at the waterworks it should not be necessary to give so high a dose that more than a trace of free chlorine—say 0.1 p. p. m. or less—passes into supply, and this will not give a taste of chlorine per se or injure the water mains. If a heavy dose is needed it is advisable to dechlorinate the water after allowing sufficient time of contact. Installation of a chlorinator (and a dechlorinator if necessary) by a firm of repute gets over the difficulties of effecting uniform dosage at known rate.)"

A Note on the Purification of Water from Rivers Polluted by Sisal Effluent. F. C. Kelly. Kenya M. J. 1926, v. 3, 212–15, Abstract by Guy T. P. Tatham in *Bulletin of Hygiene*, vol. 2, No. 8, August, 1927, p. 651.

"Samples of water were taken from and near a river flowing through three sisal estates in Kenya. The introduction of sisal waste at the factories results in marked deterioration of the quality of the river water, as judged by the oxygen absorbed and albuminoid nitrogen figures. The oxygen absorbed seems a very convenient test for the extent of pollution by sisal effluent, as the latter contains some as yet unidentified compound which exerts marked reducing properties. The water from two wells in the zone of pollution was examined. One, formed by a barrel sunk in the ground, was known to be polluted by human excreta, and the analytical results confirm this by the high figure for chlorides and the presence of nitrites and nitrates. The other, which is not subject to such pollution, shows a much better analysis. Fish can not live in water polluted by sisal effluent; frogs, however, are found in this well. The water from the river receives natural filtration on its way to the well and the conclusion is drawn that sisal pollution is removed by filtration."

Quality of the Surface Waters of New Jersey. W. D. Collins and C. S. Howard. Water Supply Paper 596–E, U. S. Geological Survey, Dept. of the Interior, 119 pages.

"The surface waters of New Jersey are one of the most valuable natural resources of the State. They are used for public water supplies of nearly all the larger cities, and they furnish the great quantities of water required for some of the leading industries. Where unpolluted, these waters are generally clear and contain only moderate quantities of dissolved mineral constituents. The waters in the southern part of the State are softer but more highly colored than the waters in the northern part."

Report of an Outbreak of Illness at Poplar Suspected to be Due to Local Pollution of the Water Supply. G. C. Hancock. *Bulletin of Hygiene*, vol. 2, No. 12, December, 1927, p. 982. (Abstract by C. R. Cox.)

An outbreak of illness characterized by very severe diarrhea of sudden onset, accompanied by fever, occurred in Poplar, England. Nervous symptoms manifested by convulsions or fits preceded the attacks in some cases. Generally speaking, the symptoms were very alarming at the onset, but subsided in 24 hours, leaving the patients weak.

The cases occurred in a relatively small area. Records of the analyses of samples of tap water examined by the Metropolitan Water Board of London indicated that locally the tap water was of an inferior quality. Further investigation disclosed the presence of a cross connection of a private water supply of a gas plant and the public mains. No check valves were used on this cross connection.

Use Watersheds for Recreation? W. L. Stevenson and H. E. Moses. *Water Works Engineering*, vol. 81, No. 2, January 18, 1928, pp. 81-82 and 109. (Abstract by Frank Raab.)

The article draws attention to the wide use made of watersheds for recreation, the danger which is involved therein, and the persistent demand by the public to be allowed the use of watersheds that furnish public supplies. New Jersey passed a law over the governor's veto permitting bathing in any fresh water of the State, provided no trespass is committed by such use. The article also discusses the rights of riparian owners of streams, etc. Pennsylvania establishes three zones on State forestry lands that serve as watersheds for public supplies. No camping is permitted "within 1 mile by stream above intake on a watershed"; within second mile leases are granted under stringent sanitary conditions. In the third zone, which comprises the remainder of the watershed, camping is permitted under stringent sanitary regulations. Another measure that is taken is the posting signs calling attention to the fact that the area is a watershed of a public supply and warning against any act that would jeopardize the purity of the supply.

Establishing Classifications of Public Water Supplies of West Virginia—First Official Classification. E. S. Tisdale. *Quarterly Bulletin* West Virginia State Department of Health, vol. 15, No. 1, January, 1928, pp. 15–19. (Abstract by H. B. Foote.)

The State sanitary engineering division has been at work for 12 years. The grading of the public water supplies is based upon yearly bacteriological records and knowledge obtained by periodic inspection by trained sanitary engineers. There are three classifications established:

(1) "Good," 82 of 154 supplies, or 53.2 per cent.
(2) "Doubtful," 44 of 154 supplies, or 28.6 per cent.
(3) "Bad," 28 of 154 supplies, or 18.2 per cent.

A large map is included which shows the location of each of the public supplies with its proper classification.

Can Filters Be Operated Satisfactorily at Variable Rates? Harry N. Jenks, *The American City*, vol. 38, No. 2, February, 1928, p. 128. (Abstract by W. L. Havens.)

Conclusions reached after actual operation of the Sacramento, Calif., filtration plant, with respect to effects of filter overloading, were as follows: (1) Provided overload rates are kept within proper limits, operation at variable rates has of itself no deleterious effect on the quality of the effluent; (2) variations in the rate of filtration to correspond to the curve of water consumption may result in reducing the size of storage reservoirs; (3) filter runs are shortened more by duration of overload rates than by the amount of such overload; (4) the permissible duration of overload decreases rapidly with increase in filtration rates above normal.

Water Purified by Electricity. Anon. *Water Works Engineering*, vol. 81, No. 3, February 1, 1928, p. 173. (Abstract by Chester Cohen.)

Description of a new method for purifying water accomplished through the electrolysis of the foreign matters in the water by the application of electric currents. The apparatus looks like a collapsed steam radiator and is composed of a group of connected cells through which the water passes successively, the electric voltage being stepped up in successive cells. The removal of waste matter takes place in the last cells mostly where the voltage is highest.

The apparatus is being used in Austria and Germany and experiments are under way to adapt the method to American waters.

Potassium Permanganate Purifies Water. John H. D. Blanke. *Water Works Engineering*, vol. 81, No. 6, March 14, 1928, p. 338.

"A deep well water supply system was contaminated with the seeping through of surface water. The supply water acquired a yellowish color, first still clear, and later opalescent and dull. As an immediate remedy potassium permanganate was used as a radical means. The success was surprising, since it was possible to break the organic iron combinations within a short time and to discolor the water at the same time. Potassium permanganate, if applied in such a quantity that the water still has a rose color after about two hours, always kills the *Bacterium coli* and nearly effects sterility even if the water is badly contaminated. *Wasser und Gas* of 1927, No. 18, pp. 933–937, states further that a small addition of chloride of lime of a high percentage, increases the bactericide effect."

Recent Developments in Water Treatment and Filtration. John R. Baylis. *Water Works*, vol. 67, No. 1, January, 1928, pp. 37–39. (Abstract by D. E. Kepner.)

Public opinion in years past against the so-called "doping" of water has to-day largely given way to indifference, leaving the water chemist unhampered in developing the types of treatment best suited to the particular waters at hand.

Among recent water treatment developments of note are the following: The prevention of corrosion and also the prevention of calcium carbonate deposition by proper chemical balance of the water; the use of pH tests for optimum coagulation control; the use of mechanical stirring devices for hastening chemical reactions and floc formation; the continuous removal of sludge, economical where the volume is over 0.05 per cent of the volume of water treated; the use of aeration to reduce the CO_2 content of water treated with aluminum sulphate; and the use of excess lime and recarbonation for treating hard waters.

"Experiments on the use of jets of water thrown into the filter sand while it is raised in washing, from a system of piping just above the sand surface, seem to work very well." An attempt, with partial success, has been made to develop a recording hydrogen ion machine, and work is also under way on devices for automatically recording the residual chlorine in water.

An Unusual Water Works. Willem Rudolfs. *Water Works*, vol. 67, No. 1, January, 1928, pp. 7–8. (Abstract by D. E. Kepner.)

At the Philips Glow Lamp Works, a water supply of about 2,000,000 gallons daily, having very little CO_2 and iron, and no manganese, is required for manufacturing use. The raw water, obtained from 42 driven wells, 60 feet apart and alternating 120 and 240 feet deep, contains 20 to 25 p. p. m. CO_2, 2 to 3 p. p. m. iron, and 0.3 to 0.4 p. p. m. manganese. The treatment plant comprises opposed jet aerators, a contact basin, filled with crushed lava, two settling tanks with detention of one hour, and two sand filters apparently arranged in series. $KMnO_4$ is added between the two filters to remove manganese. The effluent contains 2 to 4 p. p. m. CO_2, 0.1 p. p. m. iron, and no manganese. The filters are washed with air, as well as water. The neatness and attractive appearance of the plant are mentioned.

Zeolite Process of Water Softening. A. S. Behrman. *Water Works*, vol. 67, No. 1, January, 1928, pp. 26–28. (Abstract by D. E. Kepner.)

The recently developed gel-type zeolite has greater softening capacity and gives less trouble from disintegration than natural green sand and the older synthetic bare-exchange minerals. The gel type likewise permits greater rates of softening, and gives greater salt economy.

DEATHS DURING WEEK ENDED APRIL 14, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended April 14, 1928, and corresponding week of 1927. (From the Weekly Health Index, April 18, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Apr. 14, 1928	Corresponding week, 1927
Policies in force	70, 634, 185	67, 347, 002
Number of death claims	16, 955	12, 654
Death claims per 1,000 policies in force, annual rate	12. 6	9. 8

Deaths from all causes in certain large cities of the United States during the week ended April 14, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, April 18, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Apr. 14, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Apr. 14, 1928 [3]
	Total deaths	Death rate [1]		Week ended Apr. 14, 1928	Corresponding week 1927	
Total (67 cities)	8, 428	14. 7	13. 6	1, 000	830	82
Akron	62			10	4	109
Albany [3]	41	17. 8	17. 9	5	2	102
Atlanta	83	17. 1	16. 5	11	10	
White	40		13. 1	4	4	
Colored	43	(4)	24. 7	7	6	
Baltimore [3]	284	17. 9	14. 1	31	24	98
White	229		12. 2	22	13	88
Colored	55	(4)	25. 1	9	11	141
Birmingham	62	14. 6	18. 0	11	8	94
White	26		13. 3	3	3	41
Colored	36	(4)	25. 2	[illegible]	5	180
Boston	245	16. 0	14. 7	[illegible]	31	108
Bridgeport	34			5	1	92
Buffalo	176	16. 6	11. 3	22	10	94
Cambridge	29	12. 1	16. 0	4	5	71
Camden	47	18. 1	14. 5	1	4	16
Canton	24	10. 7	13. 3	3	6	71
Chicago [3]	784	13. 0	13. 1	108	87	93
Cincinnati	170	21. 5	18. 5	20	14	121
Cleveland	212	11. 0	11. 3	22	22	60
Columbus	83	14. 6	15. 4	8	6	75
Dallas	52	12. 5	10. 1	9	8	
White	42		9. 3	7	7	
Colored	10	(4)	15. 2	2	1	
Dayton	44	12. 5	11. 8	5	5	83
Denver	96	17. 1	14. 4	10	10	
Des Moines	31	10. 7	9. 1	1	2	17
Detroit	358	13. 6	12. 2	58	59	90
Duluth	24	10. 7	15. 5	5	3	117
El Paso	45	20. 0	9. 6	14	5	
Erie	29			2	3	41
Fall River [3]	32	12. 5	13. 0	7	10	120
Flint	36	12. 6	8. 0	9	3	115
Fort Worth	45	14. 0	8. 9	6	1	
White	33		8. 3	3	1	
Colored	12	(4)	13. 3	3	0	
Grand Rapids	43	13. 7	10. 0	6	5	90
Houston	67			12	7	
White	45			9	2	
Colored	22	(4)		3	5	
Indianapolis	118	16. 1	13. 5	15	6	114
White	107		12. 7	14	5	122
Colored	11	(4)	10. 8	1	1	61
Jersey City	91	14. 7	16. 2	9	8	67
Kansas City, Kans	37	16. 4	18. 6	4	4	84
White	26		15. 7	1	2	25
Colored	11	(4)	32. 0	3	2	436

(See footnotes at end of table)

Deaths from all causes in certain large cities of the United States during the week ended April 14, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, April 18, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Apr. 14, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Apr. 14, 1928 [2]
	Total deaths	Death rate [1]		Week ended Apr. 14, 1928	Corresponding week 1927	
Kansas City, Mo	99	13.2	12.8	9	6	64
Knoxville	20	9.9	16.3	2	2	43
White	17		16.2	2	2	48
Colored	3	(4)	17.1	0	0	0
Los Angeles	241			25	24	72
Lowell	28	13.3	16.5	4	5	84
Lynn	28	13.9	16.4	2	3	50
Memphis	74	20.3	25.4	13	8	152
White	36		19.9	4	1	75
Colored	38	(4)	35.4	9	7	282
Milwaukee	148	14.2	11.6	25	10	111
Minneapolis	138	15.8	12.8	14	8	84
Nashville	55	20.7	14.8	7	3	110
White	29		12.1	3	0	64
Colored	26	(4)	21.4	4	3	240
New Bedford	29	12.7	11.3	4	5	87
New Haven	25	7.0	12.1	8	4	42
New Orleans	138	16.8	14.6	12	17	58
White	75		11.6	8	7	58
Colored	63	(4)	23.2	4	10	58
New York	1,763	15.3	14.1	196	177	79
Bronx Borough	235	12.9	12.7	20	14	60
Brooklyn Borough	564	12.8	12.5	75	68	75
Manhattan Borough	730	21.8	18.7	81	79	96
Queens Borough	174	10.6	9.0	14	13	56
Richmond Borough	60	20.8	18.9	6	3	108
Newark, N. J	116	12.8	13.7	11	13	57
Oklahoma City	34			3	2	
Omaha	51	12.0	13.1	2	6	23
Paterson	27	9.7	14.1	2	5	35
Philadelphia	659	16.7	14.0	64	43	86
Pittsburgh	206	16.0	12.3	26	18	85
Portland, Oreg	77			4	3	43
Providence	92	16.8	11.9	10	9	87
Richmond	47	12.6	14.4	4	7	52
White	23		10.3	3	3	61
Colored	24	(4)	24.4	1	4	37
Rochester	99	15.8	13.2	12	9	97
St. Louis	235	14.5	12.8	23	15	77
St. Paul	40	8.3	11.9	1	5	10
Salt Lake City [3]	24	9.1	12.3	4	2	65
San Antonio	75	18.0	16.5	21	16	
San Diego	51	22.3	17.2	5	3	95
San Francisco	186	16.6	11.7	10	9	63
Schenectady	23	12.9	11.7	4	2	125
Seattle	87	11.9	11.3	2	6	21
Somerville	15	7.6	13.3	2	2	69
Spokane	23	11.0	14.8	5	3	129
Springfield, Mass	37	12.9	12.4	4	4	63
Syracuse	54	14.2	9.0	8	3	97
Tacoma	26	12.8	13.6	1	2	26
Toledo	54	9.0	11.6	5	2	48
Trenton	59	22.2	17.2	10	5	170
Washington, D. C	141	13.4	15.3	7	14	40
White	91		13.6	4	7	33
Colored	50	(4)	20.3	3	7	55
Waterbury	26			4	3	116
Wilmington, Del	31	12.6	16.5	5	5	132
Worcester	72	19.1	17.3	8	6	97
Yonkers	21	9.1	9.2	4	1	91
Youngstown	40	12.0	13.2	6	9	80

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, Apr. 13, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended April 23, 1927, and April 21, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 23, 1927, and April 21, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr 23, 1927	Week ended Apr 21, 1928	Week ended Apr 23, 1927	Week ended Apr. 21, 1928	Week ended Apr 23, 1927	Week ended Apr 21, 1928	Week ended Apr 23, 1927	Week ended Apr. 21, 1928
New England States:								
Maine	5		5	6	116	22	1	0
New Hampshire		3				107		0
Vermont	1	2			139	30	0	0
Massachusetts	81	75	14	11	327	1,384	1	1
Rhode Island	10	5				299	0	0
Connecticut	31	24	1	5	58	363	1	0
Middle Atlantic States:								
New York	466	349	[1] 37	[1] 94	701	3,197	2	37
New Jersey	150	103	25	21	98	1,574	0	3
Pennsylvania	185	183			705	2,337	0	4
East North Central States:								
Ohio		65		54		915		3
Indiana	26	23	26	29	206	313	0	0
Illinois	118	140	133	124	1,694	234	6	10
Michigan	92	51		5	351	1,480	0	9
Wisconsin	34	21	33	1,146	538	125	11	7
West North Central States:								
Minnesota	38	18	10	33	226	90	6	2
Iowa	43	7			195	31	0	0
Missouri	52	35	10	46	367	468	1	8
North Dakota	12	3		16	157	12	0	7
South Dakota	4	1	6	20	88	36	1	0
Nebraska	2	0	1	42	528	131	2	1
Kansas	8	10	8	5	1,193	84	2	2
South Atlantic States:								
Delaware	2				13	14	0	0
Maryland [2]	47	26	64	22	16	1,014	0	1
District of Columbia	29	11	2	3	11	190	0	0
Virginia								
West Virginia	18	21	28	11	151	168	0	2
North Carolina	30	26			1,079	1,525	1	1
South Carolina	10	9	1,088	613	138	578	0	0
Georgia	10	10	102	82	177	114	1	0
Florida	10	7	39	6	143	92	1	0

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 23, 1927, and April 21, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928
East South Central States:								
Kentucky		7		107		314		0
Tennessee	4	7	106	242	84	322	0	0
Alabama	31	18	103	278	275	393	1	6
Mississippi	4	8						
West South Central States:								
Arkansas	4	4	41	259	135	247	0	0
Louisiana	16	22	21	91	63	200	0	1
Oklahoma [3]	18	19	83	640	433	390	1	1
Texas	14	29	25	65	60	282	1	0
Mountain States:								
Montana	3	5			27	5	2	5
Idaho	4				37		0	
Wyoming	1			4	81	14	0	4
Colorado	4	10	1	2	175	102	2	5
New Mexico		7		3	117	238	1	0
Arizona	1	9			21	56	0	0
Utah [2]	10	6		4	48	1	0	2
Pacific States:								
Washington	10	8	4		402	119	5	2
Oregon	3	16	34	44	355	107	1	2
California	135	97	38	36	2,619	159	10	5

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928
New England States:								
Maine	0	0	24	26	0	0	4	1
New Hampshire		0		15		0		2
Vermont	0	0	3	2	0	0	0	9
Massachusetts	0	1	462	244	0	0	3	8
Rhode Island	0	0	25	42	0	0	0	0
Connecticut	0	0	106	47	0	0	0	1
Middle Atlantic States:								
New York	0	1	1,069	621	3	6	18	14
New Jersey	0	1	387	239	0	20	6	4
Pennsylvania	0	2	522	439	0	8	16	8
East North Central States:								
Ohio		1		233		55		4
Indiana	0	0	174	94	142	128	3	1
Illinois	0	0	264	339	28	23	12	4
Michigan	0	1	226	248	41	24	6	3
Wisconsin	0	1	143	162	8	11	1	3
West North Central States:								
Minnesota	0	0	166	155	1	0	1	2
Iowa	0	0	28	56	11	32	1	2
Missouri	0	0	122	86	14	52	3	5
North Dakota	0	0	60	44	6	0	4	0
South Dakota	0	0	33	27	6	4	0	0
Nebraska	0	0	47	96	28	42	1	0
Kansas	1	1	99	198	20	71	2	0
South Atlantic States:								
Delaware	0	0	21	9	0	0	0	0
Maryland [2]	0	0	66	66	0	0	8	6
District of Columbia	0	0	27	30	0	0	0	1
Virginia	1	0			0	1		
West Virginia	0	0	31	67	13	79	1	8
North Carolina	0	2	16	22	48	96	8	6
South Carolina	0	0	8	15	23	9	6	11
Georgia	0	0	8	16	45	0	13	3
Florida	0	0	12	16	76	4	18	10
East South Central States:								
Kentucky		0		78		26		12
Tennessee	0	0	8	11	9	22	13	4

[2] Week ended Friday.

[3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 23, 1927, and April 21, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928	Week ended Apr. 23, 1927	Week ended Apr. 21, 1928
East South Central States—Contd.								
Alabama	1	2	18	10	30	5	17	5
Mississippi	0	0	3	6	2	2	6	10
West South Central States:								
Arkansas	0	0	5	21	7	4	5	4
Louisiana	0	0	9	6	3	29	11	17
Oklahoma [3]	1	2	48	54	45	154	29	7
Texas	0	0	26	52	49	53	3	2
Mountain States:								
Montana	0	1	42	14	1	18	4	1
Idaho	0	0	14	8	7	5	2	0
Wyoming	0	0	15	36	0	0	1	1
Colorado	0	0	34	85	4	8	2	1
New Mexico	0	0	11	21	2	2	0	1
Arizona	1	0	4	9	0	6	0	0
Utah [1]	0	0	19	5	6	10	0	0
Pacific States:								
Washington	0	2	55	37	62	56	2	1
Oregon	0	1	28	12	14	56	1	3
California	3	1	180	130	36	20	18	5

[1] Week ended Friday. [3] Exclusive of Tulsa.

Reports for Week Ended April 14, 1928

DIPHTHERIA

	Cases
District of Columbia	14
Mississippi	5

INFLUENZA

District of Columbia	4

MEASLES

District of Columbia	157

MENINGOCOCCUS MENINGITIS

District of Columbia	1

POLIOMYELITIS

	Cases
Mississippi	2

SCARLET FEVER

District of Columbia	27
Mississippi	11

SMALLPOX

District of Columbia	1
Mississippi	5

TYPHOID FEVER

Mississippi	5

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January, 1928										
Delaware	0	10	6		64		0	16	0	0
February, 1928										
Delaware	1	6	4		37		0	18	0	1
Florida	2	58	41	5	66	2	2	53	19	20
Hawaii Territory	3	48	8		34		0	4	0	5
March, 1928										
Alabama	8	108	1,425	76	2,321	38	2	76	67	51
Georgia	3	59	755	101	1,091	29	0	101	70	19
New Jersey	8	557	131	1	5,345		3	1,303	24	18

January, 1928

Delaware:	Cases
Chicken pox	46
Mumps	41
Scabies	1
Whooping cough	15

February, 1928

	Cases
Chicken pox:	
Delaware	24
Florida	317
Hawaii Territory	31
Conjunctivitis:	
Hawaii Territory	115
Dengue:	
Florida	1
Dysentery:	
Florida	2
Hawaii Territory (amebic)	1
Hookworm disease:	
Florida	82
Leprosy:	
Hawaii Territory	4
Mumps:	
Delaware	41
Florida	49
Hawaii Territory	49
Plague:	
Hawaii Territory	
Tetanus:	
Florida	1
Trachoma:	
Hawaii Territory	83
Typhus fever:	
Florida	
Whooping cough:	
Delaware	21
Florida	38
Hawaii Territory	9

March, 1928

	Cases
Chicken pox:	
Alabama	365
Georgia	330
New Jersey	862
Conjunctivitis:	
Georgia	1
Dengue:	
Alabama	1
Georgia	6
Dysentery:	
Georgia	11
German measles:	
New Jersey	541
Hookworm disease:	
Georgia	15
Lead poisoning:	
New Jersey	3
Leprosy:	
New Jersey	1
Lethargic encephalitis:	
Alabama	1
Mumps:	
Alabama	223
Georgia	140
Ophthalmia neonatorum:	
New Jersey	4
Paratyphoid fever:	
Georgia	
Septic sore throat:	
Georgia	57
Trachoma:	
New Jersey	6
Trichinosis:	
New Jersey	
Tularaemia:	
Georgia	6
Typhus fever:	
Alabama	1
Whooping cough:	
Alabama	103
Georgia	58
New Jersey	568

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 100 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,575,000. The estimated population of the 95 cities reporting deaths is more than 30,900,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended April 7, 1928, and April 9, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	1,487	1,799	
100 cities	801	1,187	886
Measles:			
42 States	19,472	15,764	
100 cities	7,719	5,104	
Poliomyelitis:			
44 States	25	18	
Scarlet fever:			
43 States	4,390	5,469	
100 cities	1,652	2,341	1,347
Smallpox:			
42 States	1,261	770	
100 cities	108	155	118
Typhoid fever:			
43 States	186	204	
100 cities	27	47	46
Deaths reported			
Influenza and pneumonia:			
95 cities	1,472	1,078	
Smallpox:			
95 cities	0	0	

City reports for week ended April 7, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	6	0	1	0	0	5	11	4
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	2
Manchester	84,000	0	2	0	0	0	0	0	1
Vermont:									
Barre	[1] 10,008	4	0	0	0	0	0	0	0
Burlington	[1] 24,089	0	0	0	0	0	1	0	1
Massachusetts:									
Boston	787,000	22	40	23	8	2	353	6	37
Fall River	131,000	4	3	3	0	0	11	0	2
Springfield	145,000	6	3	8	0	1	0	43	0
Worcester	193,000	5	4	3	3	1	64	36	5
Rhode Island:									
Pawtucket	71,000	3	1	1	0	0	1	9	0
Providence	275,000	0	8	5	0	1	230	3	7
Connecticut:									
Bridgeport	(2)	0	6	3	1	1	1	0	6
Hartford	164,000	19	6	6	1	0	21	4	6
New Haven	182,000	13	3	2	0	1	129	86	9

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended April 7, 1928—Continued

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	2	10	17	1	0	138	35	20
New York	5,924,000	203	245	285	77	37	1,676	0	309
Rochester	321,000	13	10	1		0	32	26	7
Syracuse	185,000	18	5	1		0	156	16	7
New Jersey:									
Camden	131,000	3	6	7	1	1	34	4	11
Newark	459,000	25	11	22	15	0	433	15	17
Trenton	134,000	0	4	7	0	0	13	0	6
Pennsylvania:									
Philadelphia	2,008,000	58	69	39	1	20	500	60	88
Pittsburgh	637,000	28	18	7	0	5	101	59	33
Reading	114,000	12	2		0	0	4	0	2
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	2	7	11	0	9	91	2	24
Cleveland	960,000	56	26	38	18	2	43	154	29
Columbus	285,000	8	4	0	0	0	45	9	5
Toledo	295,000	17	3	0	0	0	230	8	7
Indiana:									
Fort Wayne	99,900	3	2	2	0	0	0	0	3
Indianapolis	367,000	19	5	1	0	1	78	49	16
South Bend	81,700	1	1	0	0	0	0	0	3
Terre Haute	71,900	7	0	0	0	1	0	0	0
Illinois:									
Chicago	3,048,000	87	74	104	79	29	34	45	189
Springfield	64,700	5	1	0	2	2	0	9	2
Michigan:									
Detroit	1,290,000	44	52	17	13	6	1,151	20	68
Flint	136,000	31	3	1	0	0	91	83	5
Grand Rapids	156,000	1	3	0	0	1	33	16	1
Wisconsin.									
Kenosha	52,700	28	1	0	0	0	5	0	0
Milwaukee	517,000	61	15	9	4	4	9	31	20
Racine	69,400	4	2	2	0	0	1	6	2
Superior	[1] 39,671	3	0	0	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota									
Duluth	113,000	4	0	0	0	0	0	3	2
Minneapolis	434,000	78	14	13	0	1	50	37	18
St. Paul	248,000	14	12	2	0	1	1	24	10
Iowa:									
Davenport	[1] 52,469	1	1	1	0		1	0	
Des Moines	146,000	0	2	0	0		0	0	
Sioux City	78,000	1	1	0	0		14	19	
Waterloo	36,900	0	0	0	0		3	13	
Missouri:									
Kansas City	375,000	20	5	4	1	4	25	94	18
St. Joseph	78,400	3	1	0	0	1	1	9	3
St. Louis	830,000	19	38	30	4	1	287	7	
North Dakota:									
Fargo	[1] 26,403	3	1	0	0	0	0	4	1
Grand Forks	[1] 14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	4	0	0	0		0	0	
Sioux Falls	[1] 30,127	0	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	3	1	3	0	0	0	18	0
Omaha	216,000	6	2	0	0	0	2	1	3
Kansas:									
Topeka	56,500	19	1	3	2	0	0	13	1
Wichita	92,500	17	2	0	0	0	8	0	4
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	3	2	3	0	0	6	1	2
Maryland:									
Baltimore	808,000	61	28	26	13	5	609	15	40
Cumberland	[1] 33,741	0	1	0	0	0	0	0	0
Frederick	[1] 12,035	0	0	0	0	0	7	0	0

[1] Estimated, July 1, 1925.

City reports for week ended April 7, 1928—Continued

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
SOUTH ATLANTIC—con.									
District of Columbia:									
Washington	528,000	12	11	15	2	3	234	0	20
Virginia:									
Lynchburg	30,500	1	1	0	0	0	37	0	1
Norfolk	174,000	24	0	0	0	0	55	0	4
Richmond	189,000	1	2	1	0	2	180	2	6
Roanoke	61,900	6	0	0	0	0	3	1	3
West Virginia:									
Charleston	50,700	1	1	1	0	0	1	0	1
Wheeling	[1] 56,208	3	1	0	0	0	7	3	4
North Carolina:									
Raleigh	[1] 30,371	1	0	1	0	0	39	0	3
Wilmington	37,700	8	0	0	0	0	3	0	2
Winston-Salem	71,800	8	0	0	0	0	63	7	4
South Carolina:									
Charleston	74,100	1	0	0	21	0	10	0	0
Columbia	41,800	13	0	0	0	0	8	22	2
Greenville	[1] 27,311	0	0	0	0	0	1	4	0
Georgia:									
Atlanta	([2])	19	2	3	19	0	32	12	6
Brunswick	[1] 16,809	0	0	0	0	0	5	1	0
Savannah	94,900	5	0	0	3	1	3	0	3
Florida:									
Miami	[1] 69,754	20	5	3	1	0	1	7	3
St. Petersburg	[1] 26,847		0			0			1
Tampa	102,000	9	0	0	0	0	0	1	1
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	0	1	1	0	2	3	0	8
Louisville	311,000	2	4	0	5	2	107	5	30
Tennessee:									
Memphis	177,000	13	4	2	0	5	33	7	12
Nashville	137,000	1	1	1	0	1	36	3	10
Alabama:									
Birmingham	211,000	0	1	0	0	2	0	0	6
Mobile	66,800	0	0	1	0	2	1	0	1
Montgomery	47,000	8	0	0	0		12	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	0	0	0	0		0	0	
Little Rock	75,900	0	0	1	0	4	7	0	7
Louisiana:									
New Orleans	419,000	10	7	16	7	4	2	0	11
Shreveport	59,500	1	0	0	0	0	35	0	7
Oklahoma:									
Oklahoma City	([2])	0	1	2	21	1	42	6	7
Texas:									
Dallas	203,000	11	4	5	0	7	7	0	7
Fort Worth	159,000	8	2	2	0	0	6	3	7
Galveston	49,100	0	1	2	0	0	7	0	0
Houston	[1] 164,954	1	2	6	0	2	39	2	8
San Antonio	205,000	1	1	3	0	9	12	0	5
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	1	0	0	0	0	0	0
Great Falls	[1] 29,883	3	0	0	0	1	0	0	0
Helena	[1] 12,037	0	0	0	0	0	0	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	1	0	0	0	0	0	1	0
Colorado:									
Denver	285,000	45	9	4		8	72	166	6
Pueblo	43,900	9	1	0	0	0	2	0	2
New Mexico:									
Albuquerque	[1] 21,000	6	0	0	0	0	29	1	1

[1] Estimated, July 1, 1925.
[2] No estimate made.

City reports for week ended April 7, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MOUNTAIN—continued									
Utah:									
Salt Lake City	133,000	24	3	1	0	0	6	3	3
Nevada									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	20	5	0	0	--------	105	4	--------
Spokane	109,000	3	2	0	0	--------	0	0	--------
Tacoma	106,000	10	1	1	0	0	11	21	3
California:									
Los Angeles	(2)	59	41	16	13	1	26	40	19
Sacramento	73,400	7	2	0	0	0	--------	1	2
San Francisco	567,000	68	20	13	0	1	33	50	7

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	4	4	0	0	0	3	0	0	0	5	26
New Hampshire											
Concord	1	0	0	0	0	1	0	0	0	0	14
Manchester	3	0	0	0	0	1	0	0	0	0	10
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	1
Burlington	1	0	0	0	0	1	0	0	0	0	6
Massachusetts:											
Boston	77	74	0	0	0	15	1	0	0	51	209
Fall River	4	3	0	0	0	2	0	1	1	1	26
Springfield	6	16	0	0	0	1	0	0	0	10	30
Worcester	10	6	0	0	0	7	0	0	0	23	81
Rhode Island:											
Pawtucket	1	7	0	0	0	0	0	0	0	0	17
Providence	9	27	0	0	0	2	1	0	0	0	88
Connecticut:											
Bridgeport	12	3	0	0	0	4	1	0	0	2	40
Hartford	5	2	0	0	0	1	0	0	0	8	--------
New Haven	11	2	0	0	0	4	0	0	0	19	42
MIDDLE ATLANTIC											
New York:											
Buffalo	24	51	0	0	0	9	0	0	1	26	157
New York	281	486	0	0	0	124	9	1	1	114	1,862
Rochester	16	10	0	0	0	5	0	0	0	6	80
Syracuse	13	13	0	0	0	2	1	0	0	32	58
New Jersey:											
Camden	6	6	0	0	0	1	0	0	0	1	56
Newark	30	38	0	0	0	8	0	1	0	36	129
Trenton	4	1	0	0	0	1	1	0	0	0	39
Pennsylvania:											
Philadelphia	96	103	0	0	0	25	3	0	0	38	591
Pittsburgh	30	24	0	0	0	7	0	0	0	23	210
Reading	4	20	0	0	0	1	0	0	0	8	26

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended April 7, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	19	22	1	0	0	16	0	1	1	5	171
Cleveland	37	21	0	0	0	20	1	0	0	40	241
Columbus	10	14	2	1	0	4	0	0	0	8	93
Toledo	14	4	2	1	0	5	1	1	0	7	85
Indiana:											
Fort Wayne	7	0	3	3	0	0	0	2	0	8	17
Indianapolis	9	9	10	2	0	10	0	0	0	3	121
South Bend	4	0	1	0	0	0	0	0	0	0	15
Terre Haute	2	0	0	12	0	1	0	0	0	0	29
Illinois:											
Chicago	123	120	2	2	0	68	2	0	1	70	957
Springfield	2	18	0	1	0	0	1	0	0	0	26
Michigan:											
Detroit	93	110	1	3	0	34	1	1	0	61	375
Flint	7	16	1	11	0	1	1	0	0	6	23
Grand Rapids	8	3	0	0	0	0	0	0	0	4	28
Wisconsin:											
Kenosha	3	0	0	1	0	0	0	0	0	6	6
Milwaukee	26	43	2	0	0	8	1	0	0	16	131
Racine	4	0	0	0	0	0	0	0	0	4	10
Superior	3	9	1	0	0	0	0	0	0	0	6
WEST NORTH CENTRAL											
Minnesota:											
Duluth	8	3	1	0	0	2	0	2	0	0	25
Minneapolis	50	32	5	0	0	4	0	0	0	5	103
St. Paul	33	8	4	0	0	5	1	0	0	19	71
Iowa:											
Davenport	1	5	4	0			0	0		6	
Des Moines	5	4	2	15			0	0		0	
Sioux City	2	2	2	1			0	0		1	
Waterloo	2	4	0	1			0	1		0	
Missouri:											
Kansas City	13	38	3	8	0	5	0	0	0	7	113
St. Joseph	3	1	0	4	0	0	0	0	0	0	28
St. Louis	38	31	4	1	0	5	1	0	0	28	282
North Dakota:											
Fargo	2	1	0	0	0	0	0	0	0	13	4
Grand Forks	1	2	0	0			0	0		0	
South Dakota:											
Aberdeen	3	0	0	0			0	0		3	
Sioux Falls	4	5	1	0			0	0		0	
Nebraska:											
Lincoln	3	1	0	4	0	0	0	0	0	2	14
Omaha	3	5	7	6	0	4	0	0	0	2	54
Kansas:											
Topeka	4	5	0	3	0	1	0	0	0	3	11
Wichita	4	5	1	19	0	1	0	0	0	11	34
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	0	0	0	0	3	0	0	0	0	28
Maryland:											
Baltimore	37	28	0	0	0	13	2	3	1	37	254
Cumberland	0	0	0	0	0	0	0	0	0	0	16
Frederick	0	0	0	0	0	0	0	0	0	0	0
District of Col.:											
Washington	23	40	2	2	0	13	1	0	1	16	137
Virginia:											
Lynchburg	1	0	0	0	0	0	0	0	0	4	15
Norfolk	1	5	0	0	0	2	0	0	0	3	
Richmond	2	4	0	0	0	5	0	0	0	0	49
Roanoke	1	1	1	0	0	0	0	0	0	0	18
West Virginia:											
Charleston	1	4	4	0	0	0	0	1	0	0	14
Wheeling	2	2	0	0	0	1	0	0	0	0	26
North Carolina:											
Raleigh	0	2	0	3	0	0	0	0	0	0	12
Wilmington	0	0	1	0	0	0	1	0	0	5	13
Winston-Salem	1	0	5	0	0	1	0	0	0	0	24

City reports for week ended April 7, 1928—**Continued**

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued.											
South Carolina:											
Charleston	0	0	0	0	0	1	0	0	0	5	14
Columbia	0	2	1	1	0	1	0	0	0	2	13
Greenville	0	0	1	0	0	1	0	0	0	1	8
Georgia:											
Atlanta	4	14	5	1	0	4	1	0	0	3	62
Brunswick	0	0	0	0	0	0	0	0	0	0	4
Savannah	0	0	0	0	0	3	0	1	0	0	40
Florida:											
Miami	1	1	1	0	0	1	0	0	0	0	20
St. Petersburg	0	-------	0	-------	0	1	1	-------	0	-------	12
Tampa	0	0	0	1	0	2	1	2	0	0	-------
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	4	0	0	0	3	1	0	0	0	45
Louisville	6	7	1	0	0	6	1	0	0	0	110
Tennessee:											
Memphis	5	7	3	2	0	8	1	0	0	2	70
Nashville	2	0	1	0	0	4	0	0	1	0	64
Alabama:											
Birmingham	2	0	8	0	0	7	1	0	0	0	80
Mobile	1	2	1	0	0	0	0	3	1	0	15
Montgomery	0	0	0	0	-------	-------	0	0	-------	0	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	0	0	0	-------	-------	0	0	-------	2	-------
Little Rock	1	10	0	0	0	5	1	0	0	0	-------
Louisiana:											
New Orleans	6	4	1	0	0	18	2	2	1	0	156
Shreveport	0	0	1	0	0	1	0	0	0	1	40
Oklahoma:											
Oklahoma City	3	4	3	16	0	0	0	0	0	0	30
Texas:											
Dallas	2	20	3	1	0	2	1	0	0	5	60
Forth Worth	2	13	2	12	0	5	0	0	0	0	39
Galveston	1	0	1	0	0	1	1	0	0	0	12
Houston	1	1	1	0	0	5	1	2	0	0	68
San Antonio	0	2	1	0	0	9	1	0	0	0	70
MOUNTAIN											
Montana:											
Billings	1	0	1	0	0	0	0	0	0	4	9
Great Falls	1	3	1	2	0	0	0	0	0	4	6
Helena	0	1	0	2	0	0	0	0	0	0	4
Missoula	1	0	0	0	0	0	0	0	0	0	6
Idaho:											
Boise	0	0	0	0	0	0	0	0	0	0	7
Colorado:											
Denver	11	21	2	0	0	9	0	0	0	33	92
Pueblo	2	0	0	2	0	0	0	0	0	0	14
New Mexico:											
Albuquerque	1	1	0	0	0	5	0	0	0	0	14
Utah:											
Salt Lake City	2	2	1	6	0	1	0	0	0	5	25
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	3
PACIFIC											
Washington:											
Seattle	0	9	3	0	-------	-------	0	3	-------	3	-------
Spokane	6	8	6	6	-------	-------	0	0	-------	0	-------
Tacoma	2	2	5	0	0	0	0	0	0	0	23
California:											
Los Angeles	25	15	4	0	0	26	1	0	1	28	277
Sacramento	1	2	0	0	0	2	1	0	0	0	22
San Francisco	17	16	4	1	0	20	1	0	0	12	154

City reports for week ended April 7, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston [1]	0	0	1	0	0	0	0	0	0
Connecticut:									
Bridgeport	1	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	34	17	4	1	0	0	1	1	0
New Jersey:									
Newark	3	0	2	0	0	0	0	1	0
Pennsylvania:									
Philadelphia	1	1	1	1	0	0	0	0	0
Pittsburgh	2	4	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	1	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago [1]	11	3	1	1	0	0	0	0	0
Michigan:									
Detroit	0	7	0	1	0	0	0	0	0
Wisconsin:									
Milwaukee	2	3	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	2	0	0	0	0	0	0	0	0
Missouri:									
Kansas City	6	5	0	0	0	0	0	0	0
St. Louis	1	1	0	0	0	0	0	1	0
North Dakota:									
Fargo	0	1	0	0	0	0	0	0	0
Nebraska:									
Omaha	2	0	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	0	0	0	0	0	0	0
District of Columbia:									
Washington	1	0	0	0	0	0	0	0	0
Georgia:									
Atlanta	2	1	0	0	0	0	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Nashville	0	0	0	0	0	1	0	0	1
Alabama:									
Birmingham	0	0	0	0	0	1	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	0	0	3	1	0	0	0
Shreveport	0	0	0	0	0	3	0	0	0
Texas: [1]									
Houston	2	2	0	0	0	0	0	0	0
MOUNTAIN									
Colorado:									
Denver	2	0	0	0	0	0	0	0	0
Pueblo	1	0	0	0	0	0	0	0	0
Utah:									
Salt Lake City	3	1	0	0	0	0	0	0	0
Washington:									
Spokane	2	0	0	0	0	0	0	0	0
California:									
Los Angeles	1	1	0	0	0	0	0	0	0
Sacramento	0	0	0	0	1	0	0	0	0
San Francisco	0	0	0	1	0	0	0	0	0

[1] Rabies (human): 1 case and 1 death at Boston, Mass.; 1 case and 1 death at Chicago, Ill.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended April 7, 1928, compared with those for a like period ended April 9, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, March 4 to April 7, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Mar. 12, 1927	Mar 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928
101 cities	183	172	176	158	178	158	190	[2] 139	200	132
New England	128	145	137	136	130	124	137	110	181	126
Middle Atlantic	230	214	240	212	226	222	263	181	269	188
East North Central	165	171	157	135	178	148	159	146	169	121
West North Central	133	131	127	115	121	132	158	[3] 85	170	101
South Atlantic	155	124	141	139	146	112	157	121	117	88
East South Central	112	85	80	105	41	60	61	85	66	25
West South Central	190	168	161	136	174	116	178	108	335	132
Mountain	197	97	126	106	81	80	108	115	170	44
Pacific	198	171	165	125	193	105	170	[4] 78	125	77

MEASLES CASE RATES

101 cities	952	1,131	929	1,349	943	1,326	837	[2] 1,390	867	1,277
New England	198	1,657	212	2,277	198	1,536	205	2,014	270	1,874
Middle Atlantic	80	970	93	1,213	114	1,393	127	1,491	159	1,504
East North Central	1,169	865	1,233	1,063	1,138	1,009	925	1,023	957	1,034
West North Central	1,241	489	1,560	590	1,514	725	1,821	[3] 756	1,300	762
South Atlantic	783	2,784	1,010	2,972	972	2,893	1,091	2,905	936	2,285
East South Central	314	1,307	441	1,855	436	1,426	284	1,096	608	958
West South Central	1,187	1,300	1,026	1,328	1,754	1,120	935	836	2,114	436
Mountain	9,091	283	5,397	845	5,074	504	3,443	752	2,788	708
Pacific	3,252	904	2,923	830	3,163	807	2,761	[4] 550	3,051	447

SCARLET FEVER CASE RATES

101 cities	446	303	431	300	423	309	440	[2] 304	394	278
New England	591	377	546	402	479	411	530	405	367	331
Middle Atlantic	583	358	572	352	580	374	612	398	594	366
East North Central	369	292	353	296	347	306	329	266	272	252
West North Central	471	290	426	271	400	292	467	[3] 254	433	263
South Atlantic	193	268	220	223	179	224	197	221	177	179
East South Central	279	259	208	160	162	234	172	204	177	100
West South Central	120	128	62	208	58	124	54	144	99	148
Mountain	1,112	195	1,330	248	1,130	177	1,210	186	941	239
Pacific	285	192	253	217	360	202	340	[4] 213	243	133

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1927, and 1928, respectively.
[2] Fargo, N. Dak., and Tacoma, Wash., not included.
[3] Fargo, N. Dak., not included.
[4] Tacoma, Wash., not included.

Summary of weekly reports from cities, March 4 to April 7, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SMALLPOX CASE RATES

	Week ended—									
	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928
101 cities	30	22	31	21	30	25	28	[2] 25	26	18
New England	0	0	0	0	0	0	2	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	34	14	33	26	29	18	33	24	37	24
West North Central	53	92	49	64	69	125	30	[3] 65	42	84
South Atlantic	64	25	51	33	41	23	61	68	25	14
East South Central	81	20	132	20	106	25	122	30	86	10
West South Central	70	36	45	44	74	36	62	36	103	4
Mountain	0	115	90	53	18	62	9	142	27	106
Pacific	94	69	84	38	99	61	68	[4] 24	55	18

TYPHOID FEVER CASE RATES

	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928
101 cities	8	4	7	4	8	4	8	[2] 5	8	4
New England	12	2	5	7	5	9	12	5	7	2
Middle Atlantic	8	3	6	2	7	4	6	4	6	1
East North Central	1	4	4	3	4	3	1	2	5	3
West North Central	4	2	0	4	4	0	2	[3] 2	2	6
South Atlantic	11	9	11	11	13	11	16	21	9	12
East South Central	30	5	20	10	41	5	20	10	35	15
West South Central	17	4	12	12	29	8	25	12	37	16
Mountain	0	0	9	0	0	0	0	0	0	0
Pacific	10	3	18	5	10	5	24	[4] 3	8	8

INFLUENZA DEATH RATES

	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928
95 cities	27	22	31	25	27	32	22	[2] 29	23	34
New England	12	21	19	7	7	9	12	11	7	16
Middle Atlantic	25	19	31	26	26	22	21	29	26	31
East North Central	16	16	18	12	16	35	15	24	9	40
West North Central	14	12	21	16	14	16	4	[3] 19	17	16
South Atlantic	70	25	79	19	65	39	38	21	40	19
East South Central	80	42	90	84	96	89	106	78	74	73
West South Central	47	74	21	115	25	98	30	86	51	107
Mountain	54	62	18	80	27	133	27	53	36	80
Pacific	7	20	14	10	28	7	24	[4] 15	17	7

PNEUMONIA DEATH RATES

	Mar. 12, 1927	Mar. 10, 1928	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928
95 cities	188	191	184	221	167	213	163	[2] 222	162	215
New England	188	205	172	239	156	182	156	225	140	179
Middle Atlantic	222	221	226	258	198	245	186	264	198	244
East North Central	157	156	142	194	141	211	147	207	131	241
West North Central	81	96	114	130	101	118	93	[3] 132	137	122
South Atlantic	272	214	262	214	218	240	225	230	150	179
East South Central	186	272	191	335	197	240	133	288	218	397
West South Central	161	254	195	263	136	275	161	242	140	185
Mountain	170	265	161	203	170	168	161	106	242	97
Pacific	148	122	93	125	110	101	128	[4] 109	117	105

[2] Fargo, N. Dak., and Tacoma, Wash., not included.
[3] Fargo, N. Dak., not included.
[4] Tacoma, Wash., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,960,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,556,400
South Atlantic	21	21	2,890,700	2,981,900	2,890,700	2,981,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,546,900

FOREIGN AND INSULAR

CHOLERA ON VESSEL

Steamship Hawaii Maru—At Singapore from Saigon and ports—April 3, 1928.—The steamship *Hawaii Maru* was reported April 3, 1928, at Singapore, Straits Settlements, from Saigon, French Indo-China, with cholera on board. The *Hawaii Maru* sailed March 20, from Nagasaki, and from Hong Kong March 23, 1928.

THE FAR EAST

Report for the week ended March 24, 1928.—The following report for the week ended March 24, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Suez.
Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Straits Settlements.—Singapore.

CHOLERA

India.—Bassein, Calcutta, Madras, Moulmein, Rangoon.
Siam.—Bangkok.
French Indo-China.—Saigon.
China.—Canton
Straits Settlements.—Singapore.

SMALLPOX

Ceylon.—Colombo.
Iraq.—Basra.
India.—Bombay, Calcutta, Madras, Moulmein Rangoon.
French India.—Pondicherry.
Dutch East Indies.—Banjermasin.
China.—Canton, Shanghai, Hong Kong.
Japan.—Shimonoseki.

Returns for the week ended March 24 were not received from the following ports:

Dutch East Indies.—Balikpapan, Samarinda.
Kwantung.—Port Arthur, Dairen.
Towns of the South Manchurian Railway Zone.

ARABIA

Aden Protectorate—Plague.—A total of 848 cases of plague with 549 deaths has been reported in the Aden Protectorate from the date of the outbreak, January 9, to March 20, 1928.

BOLIVIA

La Paz—Mortality Statistics—1927.—The Municipal Institute of Hygiene, Health, and Social Research of La Paz has reported deaths in the city of La Paz for the year 1927 as follows:

Disease	Deaths	Disease	Deaths
Bronchitis	178	Pneumonia	156
Dysentery	112	Tuberculosis	127
Gastroenteritis	215	Typhoid fever	54
Influenza	85	Typhus fever	34
Measles	294	Whooping cough	739
Smallpox	176	Other diseases	1,150

Estimated population, 110,000.

BRAZIL

Sao Paulo—Vital statistics, 1927.—The following table gives vital statistics for the city of Sao Paulo, Brazil, for the year 1927:

Population	934,185
Marriages	7,014
Births	27,708
Still-births	1,559
Deaths	14,106
Deaths under 1 year	4,621
Deaths from—	
Cancer	496
Cerebrospinal meningitis	11
Diphtheria	59
Dysentery (amebic)	46
Dysentery (bacillary)	58
Dysentery (other)	137
Influenza	241
Lethargic encephalitis	5
Deaths from—Continued.	
Leprosy	64
Measles	95
Plague	1
Poliomyelitis	1
Rabies	6
Scarlet fever	10
Suicides	84
Syphilis	273
Tetanus	51
Tuberculosis	1,023
Typhoid fever	185
Whooping cough	77
Other communicable diseases	203

CANADA

Provinces—Communicable diseases—Week ended March 31, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from five Provinces of Canada for the week ended March 31, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Ontario	Manitoba	Alberta	Total
Influenza	41					41
Smallpox			20		7	27
Typhoid fever	1		6	4	6	17

Nova Scotia—Vital statistics—Year ended September 30, 1927.—The following data were taken from the annual report of the provincial health officer of Nova Scotia for the year ended September 30, 1927:

Population	523,837
Births	11,134
Births per 1,000 population	21.2
Deaths	6,259
Deaths per 1,000 population	11.9
Deaths of infants under 1 year	1,011
Infant mortality	90.8

Communicable diseases in Nova Scotia, year ended September 30, 1927

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis		11	Smallpox	[1] 1	
Diphtheria	200	25	Tuberculosis (pulmonary)		518
Measles	1,152	15	Tuberculosis (other forms)		99
Pneumonia		670	Typhoid fever	62	9
Scarlet fever	684	20	Whooping cough	351	47

[1] From vessel in harbor.

Quebec—Communicable diseases—Week ended April 7, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended April 7, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	21	Smallpox	15
Diphtheria	35	Tuberculosis	36
German measles	11	Typhoid fever	12
Measles	242	Whooping cough	7
Scarlet fever	86		

ECUADOR

Guayaquil—Plague—February, 1928.—During the month of February, 1928, six cases of plague with three deaths were reported at Guayaquil, Ecuador.

Plague-infected rats.—During the same period, 24,565 rats were examined at Guayaquil, and 31 rats were found plague infected.

Duran—Guayaquil—Smallpox.—During the period under report four cases of smallpox were reported at Duran (Eloy Alfaro) and five cases at Guayaquil.

ESTONIA

Communicable diseases—February, 1928.—During the month of February, 1928, communicable diseases were reported in the Republic of Estonia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	13	Scarlet fever	380
Diphtheria	42	Tuberculosis	137
Measles	78	Typhoid fever	26

Population, estimated, 1,114,630.

GREAT BRITAIN

Birth, death, and infant mortality rates in England and Wales, 1841–1925.—The following figures are taken from the annual report of the Registrar General of England and Wales for the year 1926. They show the decrease in the birth, death, and infant mortality rates over a period of 85 years.

Period	Births per annum per 1,000 population	Deaths per annum per 1,000 population	Deaths of infants under 1 year per 1,000 births	Period	Births per annum per 1,000 population	Deaths per annum per 1,000 population	Deaths of infants under 1 year per 1,000 births
1841-1845	32.3	21.4	148	1886-1890	31.4	18.9	145
1846-1850	32.8	23.3	157	1891-1895	30.5	18.7	151
1851-1855	33.9	22.7	156	1896-1900	29.3	17.7	156
1856-1860	34.4	21.8	152	1901-1905	28.2	16.0	138
1861-1865	35.1	22.6	151	1906-1910	26.3	14.7	117
1866-1870	35.3	22.4	157	1911-1915	23.6	14.3	110
1871-1875	35.5	22.0	153	1916-1920	20.1	14.4	90
1876-1880	35.3	20.8	145	1921-1925	19.9	12.2	76
1881-1885	33.5	19.4	139				

LATVIA

Communicable diseases—February, 1928.—During the month of February, 1928, communicable diseases were reported in the Republic of Latvia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	8	Puerperal fever	5
Diphtheria	44	Scarlet fever	228
Erysipelas	20	Smallpox	1
Influenza	35	Trachoma	42
Leprosy	2	Typhoid fever	65
Measles	320	Typhus fever	1
Mumps	42	Whooping cough	72

Population, estimated: 1,950,000.

NETHERLANDS

Communicable diseases—Year 1927—Average 1922-1926.—During the year 1927, cases of certain communicable diseases and deaths from these diseases were reported in the 11 provinces of the Netherlands as shown in the following table, which gives also the annual averages for the five-year period 1922 to 1926, inclusive. The figures for 1927 are provisional.

Disease	1927		Average 1922-1926	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis	108	46	111	63
Diphtheria	3,619	250	4,335	250
Dysentery	63	11	68	8
Lethargic encephalitis	101	64	[1] 80	[2] 53
Poliomyelitis	50	14	[2] 31	[2] 15
Scarlet fever	14,940	122	7,961	69
Smallpox	0	0	4	
Typhoid fever	776	87	1,218	148
Typhus fever	0	0	3	

[1] 3 years only. [2] 4 years only.

SALVADOR

Republic of Salvador—San Salvador—Mortality from malaria—Years 1925–1927.—During the period 1925 to 1927, inclusive, mortality from malaria was reported in the Republic of Salvador and the city of San Salvador, as follows:

Republic of Salvador			City of San Salvador		
Year	Population	Malaria deaths	Year	Population	Malaria deaths
1925	1,634,000	3,643	1925	86,000	172
1926	1,657,000	4,066	1926	87,000	209
1927	1,688,000	3,356	1927	88,000	186

SWITZERLAND

Lucerne (Canton)—Communicable diseases—January-February, 1928.—Communicable diseases were reported in the Canton of Lucerne, Switzerland, during the months of January and February, 1928, as follows:

Disease	Cases		Disease	Cases	
	January, 1928	February, 1928		January, 1928	February, 1928
Cerebrospinal meningitis	1		Measles	46	39
Diphtheria	7	18	Scarlet fever	10	13
Influenza		5	Typhoid fever		1
Lethargic encephalitis		8	Whooping cough	26	21

Population: 45,700.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C, indicates cases: D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927 24	31	January, 1928 7	14	21	28	February, 1928 4	11	18	25	March, 1928 3	10	17	24	31	Apr. 7, 1928
China:																						
Amoy	C	28	72	16																		
	D	7	3																			
Canton	C	31	36	14	12	1														1	1	
	D	16	25	14	11	1														1	1	
Foochow	C	P	P	P																		
Hong Kong	C	P	1	P																		
Shanghai (settlement and concession)—																						
Foreigners only	C	1	6	3																		
Including natives	D	20	74	7																		
Swatow	C	42	P	P	P																	
	D		P	P	P																	
Tientsin	C	P	15	2	P	1																
Dutch East Indies: Java—Batavia	C				28	3																
	D				18	3																
India	C	45, 163	31, 390	20, 160	23, 047	25, 139	4, 624	3, 960	3, 550	3, 243	3, 267	3, 097	3, 026	3, 001	2, 865							
	D	22, 051	15, 895	10, 371	12, 863	15, 026	2, 617	2, 353	2, 046	1, 847	1, 765	1, 739	1, 684	1, 562	1, 529							
Bassein	D												1			1	1			4	25	
Bombay	C	42	3		2							1										
	D	30	2		2													1	1		1	
Calcutta	C	87	76	101	199	428	60	42	43	22	39	36	70	58		80	99	162				
	D	40	39	64	138	281	48	34	27	16	18	24	38	32	35	42	63	101	94	122	114	
Madras	C	547	59	14	13	1				1	1			1		3	11					
	D	278	48	8	7	2				1		3		1	2	2	7	7		2	1	
Madras Presidency	C	7, 060	3, 056	2, 050	3, 073	3, 702	503	382	482	497	1, 163	1, 301	1, 305	912	930							
	D	3, 513	1, 581	1, 055	1, 736	2, 104	241	209	254	280	623	813	728	498	504							
Negapatam	C										4											
	D										4	1		1	2	2						
Rangoon	C	1	2	6	2	8	1	2		1	4		1	1	10	12	3	4	2			
	D	1	2	5	5	6	1	1		1			1	1	8	4	2	4	2	3	6	
Tuticorin	C			1		8																
	D			1	37	14														1		

India (French):																						
Chandernagor	C	1	1		6	10	6	3	4	1	1		5		2	2						
	D	1			6	10	4	2	2	1			1		2	2						
Karikal	C	18	1		1	1			6	2	9	7	8	8	2	2						
	D	12	1		1	1			4		5	4	5	5	2	1						
Pondicherry	C	12	15		1	25	4	1	2	4	2	3	2	5	17	10						
	D	11	15		1	21	6	1	2	3	2	3	2	3	12	4						
Indo-China: Saigon	C		1	1					2	1	1	1		2	1	5	2	8	27	13	21	
	D								1					1	1	1		6	19	8	12	
Iraq [1]																						
Philippine Islands: Manila	C	1																				
Siam	C	77	40	18	110	88	24	24	13	49	50	33	48	69	74	59						
	D	53	24	11	76	64	18	21	5	36	34	21	42	42	50	38						
Bangkok	C	2	3	5	4	3	2	3	7	9	11	28	28	34	23	17	12		8	12	16	
	D	1	1	3	2	2	2	1	3	5	7	16	26	17	12	11	7		5	5	12	
Straits Settlements: Singapore	C				7	5	3	15	3	2	2			1					1			
	D				5	4	1	4	5	2	1								1			
On vessel:																						
S. S. Adrastus: At Yokohama, Japan	C	1																				
	D	1																				
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C																					
S. S. Tabaristan: At Basra, Iraq	C			1																		

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

Place		July-September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928			March, 1928	
				1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20
Indo-China (French):																	
Annam	C	3,179	226	13	75	38	16	2		79	95	93	23	36	14	18	18
Cambodia	C	251	180	56	1	28	21	12	39	30	9	15	38	22	51	33	22
Cochin-China	C	469	178	21	27	52	17	38	58	46	119	130	178	113	153	206	217
Laos	C	246	67	10													
Tonkin	C	1,297	1			1			2	1							
Kwangchow-wan	C	16															

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928					April, 1928	
						24	31	7	14	21	28	4	11	18	25	3	10	17	24	31	7	14
Algeria: Oran	C	1		2																		
	D	1																				
Arabia: Aden	C								19	13	22	54	89	63	45	77	158	189	148	151		
	D								7	8	8	33	55	50	31	26	99	134	135	134		
Argentina:																						
Bahia Blanca district	C				3																	
Buenos Aires	C												2									
Cordoba Province	C		P	P	10	1	1															5
Firmat	C				1																	
Quilino	C				3																	
Rosario	C				4	2	3				4			1								
Santiago Province	C													1								
Ucacha	C				1																	
Azores: St. Michaels Island	C	2	3	3	3	1		1		3	1	2	2	1	1	1		1				
	D	1	1		1				1	1	1	1	1			1		1				

Brazil:																						
Bahia	C						1	2	1	2		2	1	4	4							
	D						1	1	2		1	2	1	2	3							
Porto Alegre	C															2						
Rio de Janeiro	C									1		1	2	1	1							
	D												1	2								
British East Africa:																						
Tanganyiki	C		P	P	P	P						2										
	D											2	2									
Uganda	C	226	99	99	67	23	21	24	11	16												
	D	158	88	96	61	21	17	15	11	12												
Canary Islands:																						
Las Palmas	C		9		3			2	1	1				1				2		2		
	D				1				1	1				1								
Teneriffe	C									1	3	3	3									
	D									1		3										
Ceylon: Colombo	C	3	1		6	3	2	1	1	1	1	1		3	3	4	1	3		4		
	D	3			6	3	1	1	1	1	1			1	3	1	1	3		2		
China: Tungliao	D		200																			
Dutch East Indies:																						
Balik-Papan	C					1																
	D					1																
Celebes—Makassar	C			6	2	2	1		3	2	1	1	1		1							
	D			6	2	2	1		2	2	1	1	1		1							
Java	D	432	779	829	1,017	209	179	176	187	197	214											
Batavia and West Java	C	68	130	132	154	32	36	24	36	46	37	27	31	15	24							
	D	68	129	132	152	32	36	24	36	44	37	27	31	15	24							
Cheribon	C				1																	
	D				1																	
East Java and Madura	C	18	17	10	8	3	2	1	1	5	2											
	D	18	17	10	8	3	2	1	1	5	2											
Pasoeroean Residency	C				P											P						
Surabaya Residency	C				P															1		
	D																			1		
Surakarta Residency	C			P	P																	
Egypt:																						
Alexandria	C	1			12	3	2					1		1								
	D				7	1	1					1		1								
Cairo	C						2															
	D						2															
Suez	C	1							1	1		3		3	4	2	3		4	7	3	
	D								1	1		1		3	3	2	1		2	3	4	
Greece:																						
Athens and Piræus	C	3	1				2	1														
	D		1				1															
Mitylene	C	5	1	3	3																	
Patras	C	2	1	1																		
	D		1	1																		
Hawaii Territory: Hawaii	D													1								

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

Place		Aug. 28–Sept 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928					April, 1928	
						24	31	7	14	21	28	4	11	18	25	3	10	17	24	31	7	14
India	C	2,710	3,246	3,600	5,518	1,085	1,197	2,596	2,219	2,544	2,699	3,601	3,808	5,188								
	D	1,428	1,792	2,065	3,269	733	899	1,804	1,498	1,653	1,661	2,577	2,630	3,585								
Bassein	D	14	8	4	4	2	13	2		3	3		2	1	2	4	5	5	5	7		
Bombay	C	7	4				1		2	5	4	2	3	5	14	7						
	D	5	3				1		1	2	2	3	2	6	14	7	6	4	11	25		
Calcutta	C	18																				
	D	10									1											
Madras Presidency	C	465	583	470	791	174	167	56	153	107	132	79	134	142	112	185						
	D	230	298	282	359	69	27	38	72	63	64	60	69	79	72	100						
Rangoon	C	6	11	11	15	2	4	4	7	8	9	7	11	15	16	6	11					
	D	6	11	11	15	2	3	4	7	7	7	6	10	12	15	6	10	4	9	5		
Indo-China: Saigon	C	2		1																		
Iraq:																						
Baghdad	C									1	1		2		1	1						
	D									1			1		1	1						
Dulaim Liwa	C											1										
Nigeria: Lagos	C			17	13	2	1	1	6	2	3	3	2	2	3	2	1	2				
	D			17	13	1	1	1	5	3	3	3	2	2	3	2	1	2				
Senegal: [1]																						
Baol	C	72	95	P	P																	
	D	33	40																			
Cayor	C	463	176	48																		
	D	233	88	28																		
Dakar	C	20	1																			
	D	12																				
Louga	C	5	8																			
	D	4																				
Rufisque	C	16																				
	D	12																				
Thies and vicinity	C	9	1	1																8		
	D	7																		4		
Siam	C		13	1	3	1	7	4	4	5	3	6	6	13	4							
	D		9		2	1	1	5	4	1	1	5	5	10	4							
Bangkok	C		2				1				1	1		1						1		
	D			1			1				1	1		1						1		

	D			1									1	1	1				1			
Tunisia [2]																						
Turkey: Constantinople	C	1	1		2																	
	D		1		1																	
Union of South Africa:																						
Cape Province	C			2	2					1												
	D			2	1					1												
Orange Free State	C			1	8						2		3	4	1							
	D			1	6						1		3	1								
U. S. S. R.:																						
Chita district	C		1																			
	D		1																			
Northern Caucasus	C	14	1																			
	D	10																				
Venezuela: State of Miranda—Tacata and Cua	C																P					
On vessel:																						
At La Plata, from Rosario, Argentina	C						1															
S. S. Aghios Gerasimos, at Vigo, Spain	C			3																		

[1] During January, 1928, 5 cases of plague were reported in interior of Senegal, and 17 cases with 13 deaths during last 2 weeks in February.
[2] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

Place		July-September	October	November	December	January	February	March
Algeria: Algiers	C		2					
British East Africa: Kenya	C	95	18	28	16	26		
Ecuador: Guayaquil	C	15	4	9	5	4	6	
	D			3	2	4	3	
Indo-China (French)	C	14	3	3	4	7		5
Madagascar	C	314	166	209	317	427	342	
	D	286	155	189	261	388	317	
Ambositra Province	C	7	6	1	18	105	67	
	D	7	6	1	10	96	66	
Antsirabe Province	C	39	19	18	72	117	108	
	D	38	19	17	72	117	108	
Itasy Province	C	46	16	26	62	33	19	
	D	41	15	25	54	29	17	
Moramanga Province	C	12	24	46	25	19	25	
	D	12	20	41	22	19	24	
Madagascar—Continued.								
Tananarive Province	C	211	99	170	139	155	123	
	D	189	93	153	108	129	102	
Mauritius	C	1						
Nigeria	C	32	27	16	20	16		
	D	29	27	16	18	16		
Peru	C	34	14	6	14			
	D	19	5	2	4			
Callao	D	3			3			
Lima	C				7			
	D		1	1	1			
Syria: Beirut	C				2			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927: 24	December, 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	Apr. 7, 1928
Algeria	C	459	382	683	661	170	81	26	7	15	17	18	20	16	30							
Algiers	C					3	3	4		2	3	1	7	4	4		5	1		2		
Oran	C	9	16	11	20	39	8	15	2	4	2	2	4	3	1		2	2		2		
Arabia: Aden	C				1	3	1								1							
Brazil:																						
Para	C	1																				
Rio de Janeiro	C	6	10		1																	
	D	4	9		1																	
British East Africa: Tanganyiki	D	21	8	P	P	P			2	6	4		1									
British South Africa:																						
Northern Rhodesia	C	55	39	164	185	252	2	81	141	12	3		230		79	117	38	63				
	D	1	2	11	64	62		8	23				23		6	32	2	3				
Southern Rhodesia	C				3	2	1						P	3	2	4	P	3				
	D															1						
Canada:																						
Alberta	C	17	17	23	10	19		3	3	5	1	19	1	6		3		7	7	20	7	
Calgary	C	1																	1			
Edmonton	C			1	1	8			3	2	1			2	1		11	1	1	11	1	7
British Columbia: Vancouver	C		2			4	1	3	3	1	11	3	1	11	2	1	3	4	2	5		
Manotoba	C	13	9	7	19	7	2	2	2	5		1										
Winnipeg	C	5	4	2	2	2	1			1	1	1										
New Brunswick [1]	C						1									1						
Nova Scotia	C		2	1																		
Halifax	C		1	1																		
Ontario	C	60	22	96	264	347		53	83	76	52	77	63	51	40	51	36	20	19	35	20	
Hamilton	C					2													2			
Kingston	C				1		1							1								
Ottawa	C	27	40	67	134	63	18	9	10	23	20	16	23	9	11	3	1	7	6	8	10	2
Toronto	C		2	10	34	39	7		11	10	8	5	1	6	4	4	2	4	2	3	3	
Windsor	C			9																		
Quebec	C	1		8	25	16	14	3	10	17	7		11	8	11	13		18	22		35	
Montreal	C				1		1		1	6	3	4	1		5	1	3		6	3		
Quebec	C					4		2		3		5				2	5	4	3	4	4	
Riviere du Loup	C				3																	

Saskatchewan	C	14	68	31	34	58	12	13	15	12	39	15	9	34	7	8		7	14	7		
Moose Jaw	C	10	16	3		1		1	2	1	4	2	3	2		2	6	5	2	5		
Regina	C	8		5	1	1															1	2
Saskatoon	C					2		4			13	1		1		2						
Ceylon: Colombo	C	1			1	2					1		1	2	2	1	3					
	D	1				1					1									1		
China:																						
Antung	C									1												
Canton	C		1															2	3	2		
	D		1																			
Chefoo	C		1	P		P													P			
	D		1														1					
Foochow	C	P	P	P	P	P	P	P		P		P		P		P		P				
Hong Kong	C	1	2							1	1		1		1	3		3	5	7	10	
	D	1	2						1			1	1			1	1	2		2	5	
Manchuria—																						
Changchun	C					1						4										
Dairen	C			1	2	1			2	3	1		5	9	3	4	6				4	
	D			1								1	2	5	4	2	1					
Fushun	C		1		1																	
Harbin	C					2		1				2	1	2	2	1	3	1				
Mukden	C			2	1							1		3	18		3				1	
Penshihu	C			1																		
Shanghai—																						
Foreigners only	C										1	2		2	1	1	1	3	1			
Including natives	D										3	2	3	3	5	4	4	6	2	1		
Tientsin	C		4	13	8	9	2			6	20	10	10	8	5	2	2	11				
Curacao (alastrim)	C										2				3							
Dominican Republic: Santo Domingo	C																		2			
Dutch East Indies:																						
Borneo—																						
Samarinda district	C				P																	
South and East Borneo Residency	C	P																				
Java—																						
Batavia and West Java	C	4		4	25								1	3		1						
	D				15																	
East Java and Madura	C	4	22	8	9	9		3	1	1	2											
	D			1																		
Sumatra: Medan	C					3		8		1	3	5	5	10	7	3	1	3				
	D					2		1		2	4	4		3				2				
Egypt	C		3			4		4						1		1						
	D		1	1		1																
Cairo	C					2																
Great Britain:																						
England and Wales	C	568	508	473	902	1,041	255	247	275	398	405	370	386	369	369	392	365	347	359	342	322	
Birmingham	C	1		1							14	17	11	2	1		2		1			
Bradford	C				11	19	2	2	4	24	6	9	7	2	7	1		4	9		1	
Bristol	C			6	4	8						2		1			1	3		2	8	
Cardiff	C				1				1												5	
Leeds	C	5	3	7	5	16	4	6	1		1			2	1	2	4	2	3	5	3	

[1] The report of 2 cases of smallpox in New Brunswick during the week ended Sept. 24, 1927, which has been published in prior issues of the PUBLIC HEALTH REPORTS, was erroneous. No smallpox was reported in New Brunswick during September, 1927.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended—December, 1927, 24	Dec. 31	January, 1928, 7	Jan. 14	Jan. 21	Jan. 28	February, 1928, 4	Feb. 11	Feb. 18	Feb. 25	March, 1928, 3	Mar. 10	Mar. 17	Mar. 24	Mar. 31	Apr. 7, 1928
Great Britain—Continued.																						
England and Wales—Continued.																						
Liverpool	C									1								1				
London	C										2		1	5	10	1	2	1	10	5	1	
Manchester	C			3	6	25		1	2	2	11	6	4	4	1	4	1	2	4	3	3	
Newcastle on Tyne	C	1	2	6	9	55	2	13	2	5	14	3	4	6	4	1	4	3	3	4		
Nottingham	C								7	6	4	8	6	9	6	1	3	1	5	1	1	
Sheffield	C	2	1	10	6	9	3		1	10	4		4		1	2	2	1				
Stoke on Trent	C	1							3	1			1		2	4	3	6	11			
Greece: Saloniki	D	2																				
India	C	5,911	4,398	3,153	4,062	6,731	2,225	2,502	2,664	3,285	4,129	3,631	5,159	4,858	4,567							
	D	1,668	1,120	715	927	1,650	515	578	551	785	964	803	988	954	1,073							
Bassein	C	1												1								
	D	1																				
Bombay	C	33	12	10	4	9		4	4	6	10	23	10	18	29	23	46	51	49	58	62	
	D	19	8	2	3	2					2	8	7	7	15	13	23	22	24	33	36	
Calcutta	C	27	22	5	5	25		17	9	14	14	11	23	10	9	18	14	30	20	29	46	
	D	25		6	2	11		17	4	6	10	7	10	7	5	11	10	24	15	21	33	
Madras	C	6	7	8	7	11	2		11	8	9	16	20	29	15	33	21	31	30	27	45	
	D		2		2	3	1		4	1	3	2	2	1	3	3	3	10	5	3	6	
Negapatam	C	3	1							5		4	2	2	1		1	1				
	D	2	1							3		2	1									
Rangoon	C	14	9	17	6	14	36	28	23	49	41	34	103	97	68	82	132	95	98	82	92	
	D	3	2	3	1	4	5	13	4	9	13	10	18	23	22	24	26	32	28	17	34	
Vizagapatam	C		3						3		2	1	5	2		1		1			3	
	D		2								6	1		1								
India (French):																						
Karikal	C	3	1	2	P																	
	D	3	1	2																		
Pondicherry	C	39	37	38	42	41	6	16	25	18	15	17	15				6	3		6	5	
	D	31	37	38	42	41	6	14	12	18	15	17	15				6	3		6	5	
Indo-China: Saigon	C	1	1			1		1	1	1						2		1				
Iraq:																						
Baghdad	C		1	7	5	25	9	9	3	2	7	6	3	3	2		3	2				
	D		1	4	4	14	7	3	2		3	5	2	1	1		1	2				
Basra	C	1	4	2	3	4		2			1				1		2	4	4	1		
	D	1	4	2	1	3		1											1	1		
Italy:																						
Leghorn	C																1		1			
Rome and vicinity	C		1				2															

Jamaica (outside Kingston) (alastrim)	C	6	9	9	7	3		2				4	1		1	3		6	3	2		
Kingston	C		3	2																		
Japan:																						
Nagasaki	C	2																				
	D	1																				
Tokyo	C										2	1		1		1		3				
	D											1					1	1				
Mauretania	C														P	P						
Mexico:																						
Acapulco	C		2		1																	
	D		2		1																	
Chihuahua	D								1													
Jalisco (State)	C																					P
Guadalajara	D					2											1					2
Manzanillo	D									1									1			
Mexico City and surrounding territory	C					4							1	1	2							
San Luis Potosi	D	1																				
Tampico	C															1						
Torreon	D	1		2																		
Nigeria: Southern Provinces	C																7					
Palestine: Jerusalem	C					1						1										
	D											1										
Poland	C	2				1	5	1			1	1	1		1							
	D	1																				
Porto Rico	C																		P			
Portugal:																						
Lisbon	C		3	8	4	10	1	2	4	5	5	2	2	3	3	9	4		4		2	
	D					1																
Oporto	C		1																			
Senegal: Dakar	C															8			26	17		
Siam	C	51	27	6	1	9	2	5	8	8	13	7	5	10	1	7				12	3	
	D	10	15			1			2		1	1	2		1	1					2	
Bangkok	C		3		1	1		1	2													
	D		1						1													
Spain:																						
Malaga	D				1	1																
Seville	C									1												
Valencia	C			1				1	1									1		1		
Straits Settlements: Singapore	C				1								1		1				1			
Switzerland	C						2															
Tunisia: Tunis	C							2	2			3			2	4	2	6	1			
Union of South Africa:																						
Cape Province	C	P		P							P			P								
Orange Free State	C	P			P	P	P				P			P								
Transvaal	C			P	7																	
Upper Volta	C														2	3						
Venezuela: Maracaibo	D		2	1										1				1				
On vessel: S. S. Arendskerk at Singapore from Amoy, China	C																				P	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927 1-10	November, 1927 11-20	November, 1927 21-30	December, 1927 1-10	December, 1927 11-20	December, 1927 21-31	January, 1928 1-10	January, 1928 11-20	January, 1928 21-31	February, 1928 1-10	February, 1928 11-20	February, 1928 21-29	March, 1928 1-10	March, 1928 11-20
Algeria	C	376	459	382	682														
Oran	C	14	10	16	11														
Indo-China (French)	C	19	3	21	25	13	3	22	10	4	20		40	18	50	31	90	57	71
Syria:																			
Aleppo	C										1		1						
Beirut	C								1		1			15	11	26		12	7
Damascus	C		3	5	22		13		4	6	2	11	2						1

Place		July-September	October	November	December	January	February.
Angola	C	51	73	71			
	D		2				
Congo	C	5	77				
Cuanza-Norte	C	1					
Cuanza-sul	C		2		7		
Loanda	C	1					
Zaire	C	3	4	1			
Brazil: Porto Alegre	C	11	4	1			1
British East Africa: Zanzibar	C		2				
	D		1				
Chosen	C	21	2	2		4	
	D	6	1	1		2	
Ecuador: Guayaquil	C	4	1	1	4	2	9
France	C	37	7	4	14	11	10
Gold Coast	C	7	4				

Place		July-September	October	November	December	January	February
Greece	C	10	4		5	6	11
	D						2
Latvia	C		2				1
Mexico	D	221	132	157			
Morocco	C	180	81	140	401	55	47
Nigeria	C	820	223	93			
	D	173	51	30			
Persia	D			2		7	
Portugal	C					143	
	D					22	
Spain: Madrid	D			1			
U. S. S. R.:							
Railways, etc	C	26	7	11	15		
Other territories in Europe	C	366	220	471	565		
Transcaucasus, Siberia, and Central Asia	C	80	40	21	20		
Ukraine	C	27	11	20	17		

TYPHUS FEVER

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Week ended— December, 1927: 24	December, 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24
Algeria:																				
Algiers	C											1					1	2	1	1
	D																1			
Oran	C						1	1	1	1		2			2	1	6	1	1	
Austria: Vienna	C												1							
Bulgaria: Sofia	C			17	6	1	1	4	1		1									
	D				1															
Chile:																				
Antofagasta	D			1																
Valparaiso	C		1		1	2				1							1			
	D	2	1		2															
China:																				
Manchuria—Harbin	C	2			1															
Tientsin	C		2																	
Egypt	C	2		12	4	14	1		3	4	2			1				1		
	D	3		5		8			3	1										
Cairo	C					3														
	D					3														
Port Said	C			1		1														
Ireland (Irish Free State):																				
Cork County	C					3			1											
Donegal County, Letterkenny	C			4																
Mexico:																				
Guadalajara	D					1														
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	4	4	4	3	2	1		2	1		4	3	6	6
	D				2	1	1	3	1								3	1		3
Morocco	C								107	235	257	214	370	210	141			175	172	167
Palestine	C	11	1	5	3	9				8		2	2	1	1	2	6	1	5	
Poland	C	50	35	19	64	93	26	33	68	68	101	92	87	66	57	62	57	89		
	D	6	2	4	11	10	1	3	6	6	4	3	5	7	10	3	7	6		
Portugal: Oporto	C	1			1									1						

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

Place		July 31–Aug 27, 1927	Aug. 28–Sept 24, 1927	Sept 25–Oct 22, 1927	Oct. 23–Nov. 19, 1927	Nov 20–Dec. 17, 1927	Week ended— December, 1927		January, 1928				February, 1928				March, 1928			
							24	31	7	14	21	28	4	11	18	25	3	10	17	24
Rumania	C	36	16	17	22	35	32	17	19				15	24		14	26			
	D	1		2				2	1				2	7			4			
Syria: Aleppo	C		2						2											
Tunisia	C	14	1	3	1	1	1			5	4				1				13	
Union of South Africa:																				
Cape Province	C	P	P	P	P	P	P	1	P		P	P	1	P	P	P				
Natal	C	P	P	P	P	2	2	P	P	1		P		1	P	P				
Orange Free State	C			P		P							P	P	P	P				
Transvaal	C	1		5	P	P														
On vessel: S. S. Gaika at Durban, Natal—from Mauritius	C																	1		

Place		1927 July	August	September	October	November, 1927 1–10	11–20	21–30	December, 1927 1–10	11–20	21–31	January, 1928 1–10	11–20	21–31	February, 1928 1–10	11–20	21–29
Algeria	C	67	33	10	12												
	D	13			1												
Algiers	C	2	2	6	2												
Bulgaria	C	12	24	7	2						2	7	6		8	12	6
	D		1	2	1						1		1		1	2	2
Morocco	C	148	76	7	11	5	14	7	5	6	75						

Place		July-September	October	November	December	January	February
Argentina: Rosario	C			1			
	D				1	1	
China: Shanghai	D			1			
Chosen	C	90	16	26	38	183	
	D	8	1	2	3	19	
Chemulpo	C	3				1	
Gensan	C	2				1	
	D					1	
Seoul	C	5	2				
	D	1	1				
Czechoslovakia	C	12	1		6		
Greece: Athens	C	3			1	2	2
Japan	C	1		1			
Latvia	C	6					1

Place		July-September	October	November	December	January	February
Lithuania	C	69	9	18	27	86	137
	D	14	1	1	1	10	12
Mexico	D	64	36	29			
Peru.							
Arequipa	D	3	2		1	2	
Lima	D	8					
U. S. S. R.:							
Railways, etc	C	77	23	33	46		
Transcaucasus, Siberia, and Central Asia	C	208	61	49	80		
Ukraine	C	295	151	198	282		
Other territories in Europe	C	1,839	521		1,463		
Yugoslavia	C	20	1	1		7	
	D	5				3	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	November, 1927: 12	November, 1927: 19	November, 1927: 26	December, 1927: 3	December, 1927: 10	December, 1927: 17	December, 1927: 24	December, 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25
Ashanti: Obuasi	C		1																				
	D		1																				
Belgian Congo:																							
Boma	C														3								
	D														2								
Matadi	C														6	12	11	1	5	8			
	D														2	6	8	2	5	6			
Dahomey:																							
Grand Popo	C									1													
	D									1													
Porto Novo	C	1																					
	D	1																					
Ivory Coast	C	1												1									
	D	1												1									
Liberia: Monrovia	C			1																			
Nigeria	C			2																			
	D			2																			
Senegal	C	3	10	21	31	9	16	6	7														
	D	3	9	21	31	8	10	4	6														
Dakar	C	1			12	3	6		5	2	1	4			1	1							
	D				7	2	4		4	2	1	4			1	1							
Togoland	C		1																				
	D		1																				

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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SPECIAL ARTICLES

The Causes of Illness at Different Ages

Whole-time County Health Officers, 1928

UNITED STATES
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WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 43 MAY 4, 1928 NO. 18

THE CAUSES OF ILLNESS AT DIFFERENT AGES[1]

Hagerstown Morbidity Studies No. VII[2]

By EDGAR SYDENSTRICKER, *Statistician, United States Public Health Service*

In this paper the general results of the Hagerstown morbidity study which relate to the causes of illness at different ages are summarized briefly. The tables and graphs, it is believed, present the principal findings with respect to this phase of the inquiry, but a word or two of explanation may assist the reader who is not conversant with the previous reports in this series.

The record of illness was obtained from a responsible informant (usually the housewife) in each household canvassed by a trained field assistant and was supplemented by diagnoses from attending physicians in practically all cases where medical care was given, and by records of school attendance and of clinics. Forty-six per cent of the illnesses were attended by physicians; if we omit "colds" and minor digestive illnesses, 65 per cent were so attended and were diagnosed by medical practitioners. Two-thirds of the population studied were observed at intervals of 6 to 8 weeks for at least 24 of the 28 months, which was the duration of the study. Less than 1 per cent of the illnesses had to be classified as "ill-defined and unknown." For further details as to the scope and method of the study, definition of illness, etc., reference is made to the first paper of this series.

In those cases in which more than one cause was recorded, recourse was had to the practice followed in the classification of the causes of death, namely, to assign only one cause to each illness. This arbitrary procedure does not, however, affect a very large proportion

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[1] From the office of statistical investigations, U. S. Public Health Service.

[2] Other Hagerstown morbidity studies published are—

I. A Study of Illness in a General Population Group: Method of Study and General Results. Pub. Health Rep., vol. 41, No. 39, Sept. 24, 1926. Reprint No. 1113.

II. The Reporting of Notifiable Diseases in a Typical Small City. Pub. Health Rep., vol. 41, No. 41, Oct. 8, 1926. Reprint No. 1116.

III. The Extent of Medical and Hospital Service in a Typical Small City. Pub. Health Rep., vol. 42, No. 2, Jan. 14, 1927. Reprint No. 1134.

IV. The Age Curve of Illness. Pub. Health Rep, vol. 42, No. 23, June 10, 1927. Reprint No. 1163.

V. A Comparison of the Incidence of Illness and Death. Pub. Health Rep., vol. 42, No. 24, June 24, 1927. Reprint No. 1167.

VI. The Illness Rate Among Males and Females. Pub. Health Rep., vol. 42, No. 30, July 29, 1927. Reprint No. 1172.

of the cases. Of the 17,847 illnesses observed, only 3.7 per cent had more than one cause or condition recorded. The procedure in classifying these cases according to a "primary" cause was as follows:

(1) The *first* cause in order of occurrence, applied largely to acute conditions with common complications, such as influenza and pneumonia, or measles and otitis media.

(2) *Acute* conditions ordinarily were given preference over an attack of some chronic condition. Thus, in case of grippe and chronic rheumatism, the grippe was considered primary.

(3) The condition or disease *most specifically associated with the period of sickness* was preferred over a minor condition which preceded or accompanied it. For example, in tooth abscess and rheumatism, the latter was made primary. When it was difficult to determine the factual basis, the more serious condition was chosen.

(4) The *more specific* cause was given preference over a statement of a symptom.

(5) When none of the above rules could be applied, and the history of the individual gave no basis for decision, the condition mentioned first by the informant was made primary. The number of such cases was very small.

The size of the experience in the different age groups employed is shown in the following table:

TABLE 1.—*Number of white persons observed for the incidence of illness in Hagerstown, Md., December 1, 1921–March 31, 1924, expressed in terms of "years of life observed," and classified by age*

Age in years	Number of years of life observed	Age in years	Number of years of life observed
All ages [1]	16,517	15-24	2,526
0-4	1,777	25-44	4,643
5-9	2,105	45-64	2,575
10-14	1,713	65 and over	810

[1] Includes 368 years of life observed in persons whose ages were not exactly enough known for classification according to the groupings used.

With respect to the term "years of life observed," it should be stated that of necessity certain individuals and families were observed for less than the entire period of the study. In order, therefore, to state the morbidity results in terms of annual incidence rates it was necessary to resort to the familiar device of expressing the population as the number of "year-persons," or the number of "years of exposure," or, to state it more precisely, perhaps, the number of "years of life observed" within each age category. No age group includes less than 810 such years of observation.

Since our immediate purpose is to indicate the general nature of illness, rather than the incidence of specific diseases, at different ages,

the illnesses have been grouped into only 18 classes, with the exception of tonsillectomies, adenoidectomies, and other operations on the throat or nasal fossae which are shown separately. The scheme of classification used was the International List of Causes of Death, 1920 revision. This list, unsuitable as it is for any scientific classification, because of its illogical combination of anatomical, etiological, pathological, epidemiological, and other bases, is resorted to because it is the only classification generally used. Some departures, dictated by considerations which we believe will be apparent to anyone more interested in the causes of illness than in a mere scheme of classification, were made from it; but in the tables presented, the International List numbers are carried for definitive purposes.

The data so classified are presented in Table 2, together with the "years of life observed" within each age group. In Table 3 are given the annual rates, based upon the figures in Table 2.

TABLE 2.—*Number of illnesses, by age groups, in which a specified disease or condition was the sole or primary cause in a group of white persons observed in Hagerstown, Md., December 1, 1921–March 31, 1924*

Disease or condition (numbers in parentheses refer to those given in the International List of Causes of Death, 1920)	Number of illnesses in which the specified disease or condition was the sole or primary cause							
	All ages [1]	Age group						
		0–4	5–9	10–14	15–24	25–44	45–64	65+
Years of life observed	16,517	1,777	2,105	1,713	2,526	4,643	2,575	810
Total illnesses	17,847	2,822	3,270	2,034	1,871	4,162	2,553	875
Epidemic, endemic, and infectious diseases (1–42, except 11 and 31)	1,448	626	615	86	36	49	25	7
General diseases (43–69)	359	6	13	14	20	97	142	59
Diseases of the nervous system (70–84, part of 205)	728	10	45	85	64	247	201	59
Diseases of the eyes and annexa (85)	123	13	30	25	10	24	14	5
Diseases of ears and mastoid process (86)	180	51	56	37	14	16	3	2
Diseases of circulatory system (87–96)	303	17	16	27	21	60	80	72
Total respiratory (excluding operations) (11, 31, 97–107, 109)	10,844	1,623	1,901	1,329	1,244	2,618	1,500	474
Tonsillectomy and (or) adenoidectomy	120	13	66	17	13	10	1	-----
Other operations on throat and nasal fossae	8	-----	-----	-----	4	2	1	-----
Diseases of teeth and gums (part of 108)	124	2	18	30	19	41	13	1
Diseases and disorders of the digestive system (110–127, part of 108 and 205)	1,594	271	298	213	148	316	255	76
Diseases of kidney and annexa (128–134)	182	15	11	6	10	44	64	30
Diseases of genito-urinary system (nonvenereal) (135–142)	183	2	1	13	39	86	34	5
Puerperal state (143–150)	395	-----	-----	1	108	273	3	-----
Diseases of skin and cellular tissue (151–154, part of 205) [2]	291	60	79	53	24	46	17	10
Diseases of bone and organs of locomotion (155–158, part of 205)	111	2	5	5	5	47	33	12
Congenital malformations and infancy (159–163)	19	13	2	3	-----	-----	-----	-----
Senility (164)	14	-----	-----	-----	-----	-----	-----	14
External causes (165–203)	653	51	96	75	81	150	141	38
Ill-defined and unknown	168	47	18	15	11	36	26	11

[1] Including unknown ages.

[2] Includes rash, hives, and "sores on body."

TABLE 3.—*Illness rates, by age groups, from specified diseases or conditions which were the sole or primary cause in a group of white persons observed in Hagerstown, Md., December 1, 1921–March 31, 1924*

Disease or condition (numbers in parentheses refer to those given in the International List of Causes of Death, 1920)	Annual rate per 1,000							
	All ages[1]	Age group						
		0–4	5–9	10–14	15–24	25–44	45–64	65+
Total illnesses	1,080.5	1,588.2	1,553.8	1,187.4	740.8	896.4	991.3	1,079.8
Epidemic, endemic, and infectious diseases (1–42, except 11 and 31)	87.7	352.3	292.2	50.2	14.3	10.6	9.7	8.6
General diseases (43–69)	21.7	3.4	6.2	8.2	7.9	20.9	55.1	72.8
Diseases of the nervous system (70–84, part of 205)	44.1	5.6	21.4	49.6	25.3	53.2	78.0	72.8
Diseases of the eyes and annexa (85)	7.4	7.3	14.3	14.6	4.0	5.2	5.4	6.2
Diseases of ears and mastoid process (86)	10.9	28.7	26.6	2.6	5.5	3.4	1.2	2.5
Diseases of the circulatory system (87–96)	18.3	9.6	7.6	15.8	8.3	12.9	31.0	88.9
Total respiratory (excluding operations) (11, 31, 97–107, 109)	656.5	913.4	903.3	775.8	492.5	563.9	582.4	585.0
Tonsillectomy and (or) adenoidectomy	7.3	7.3	31.4	9.9	5.1	2.2	.4	------
Other operations on throat and nasal fossæ	.5	------	------	------	1.6	.4	.4	------
Diseases of teeth and gums (part of 108)	7.5	1.1	8.6	17.5	7.5	8.8	5.0	1.2
Diseases and disorders of the digestive system (110–127, part of 108 and 205)	96.5	152.5	141.6	124.9	58.6	68.1	99.0	93.8
Diseases of kidney and annexa (128–134)	11.0	8.4	5.2	3.5	4.0	9.5	24.9	37.0
Diseases of genito-urinary system (nonvenereal) (135–142)	11.1	1.1	.5	7.6	15.4	18.5	13.2	6.2
Puerperal state (143–150)	46.4	------	------	1.2	81.5	110.2	2.3	------
Diseases of skin and cellular tissue (151–154, part of 205)	17.6	33.8	37.5	30.9	9.5	9.9	6.6	12.3
Diseases of bone and organs of locomotion (155–158, part of 205)	6.7	1.1	2.4	2.9	2.0	10.1	12.8	14.8
Congenital malformations and infancy (159–163)	1.2	7.3	1.0	1.8	------	------	------	------
Senility (164)	.8	------	------	------	------	------	------	17.3
External causes (165–203)	39.5	28.7	45.6	43.8	32.1	32.3	54.7	46.9
Ill-defined and unknown	10.2	26.5	8.6	8.8	4.4	7.8	10.1	13.6

[1] Including unknown ages.

TABLE 4.—*Relative importance of the various causes of illness at different ages, based on the Hagerstown study*

Disease or condition	Per cent of total illnesses caused by specified causes and conditions at each age						
	0–4	5–9	10–14	15–24	25–44	45–64	65+
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Epidemic, endemic, and infectious diseases	22.18	18.81	4.23	1.92	1.18	0.98	0.80
General diseases	.21	.40	.69	1.07	2.33	5.56	6.74
Diseases of the nervous system	.35	1.38	4.18	3.42	5.94	7.87	6.74
Diseases of eye and annexa	.46	.92	1.23	.53	.58	.55	.57
Diseases of ear and mastoid process	1.81	1.71	1.82	.75	.38	.12	.23
Diseases of circulatory system	.60	.49	1.33	1.12	1.44	3.13	8.23
Diseases of respiratory system excluding operations	57.51	58.13	65.34	66.49	62.90	58.75	54.17
Tonsillectomy and (or) adenoidectomy	.46	2.02	.84	.70	.24	.04	------
Other operations on throat and nasal fossæ	------	------	------	.21	.05	.04	------
Diseases of teeth and gums	.07	.55	1.48	1.02	.99	.51	.11
Diseases and disorders of the digestive system	9.60	9.11	10.47	7.91	7.59	9.99	8.69
Diseases of kidney and annexa	.53	.34	.30	.53	1.06	2.51	3.43
Diseases of genito-urinary system	.07	.03	.64	2.08	2.07	1.33	.57
Puerperal state	------	------	.05	5.77	6.56	.12	------
Diseases of skin and cellular tissue	2.13	2.42	2.61	1.28	1.11	.67	1.14
Diseases of bones and organs of locomotion	.07	.15	.25	.27	1.13	1.29	1.37
Congenital malformations and infancy	.46	.06	.15	------	------	------	------
Senility	------	------	------	------	------	------	1.60
External causes	1.81	2.94	3.69	4.33	3.60	5.52	4.34
Ill-defined and unknown	1.67	.55	.74	.59	.87	1.11	1.26

The relative importance of the general groups of kinds of causes in different age periods is shown in the percentages given in Table 4. The predominance of respiratory causes, which account for over half of the illnesses in every age period, is the most striking feature of our findings. The relative importance of other groups of causes varies considerably from age to age, so that, comparing one age period with

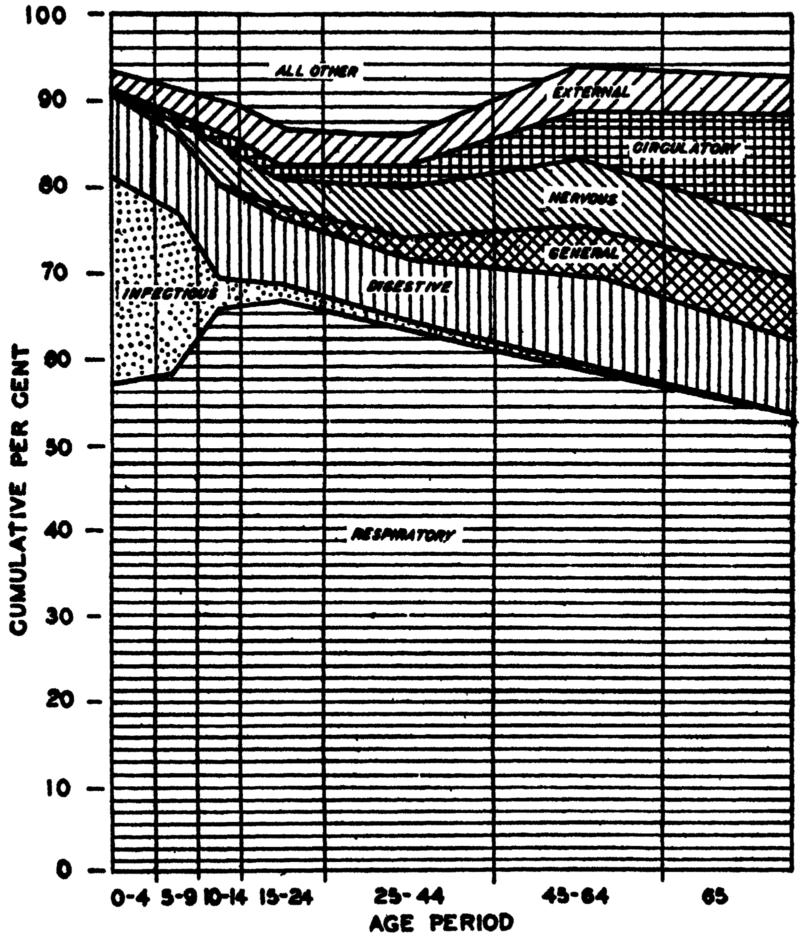

FIG 1—The relative importance of the major groups of diseases as causes of illness in different periods of life in a white population group in Hagerstown, Md, Dec 1, 1921-Mar 31, 1924 In the diagram the total illness rate at any age is 100 per cent

another, there is a marked difference in the kinds and causes of sickness. In Fig. 1 an attempt has been made to depict these contrasts.

Each period of life is characterized by its own distribution of the causes of illness. In childhood, illness other than respiratory is caused chiefly by communicable diseases, diseases and conditions of the skin, ears, eyes, and teeth, and nervous and digestive disorders; in old age

illness other than respiratory is caused by the organic group of diseases and conditions—those of the circulatory system, nervous system, and kidneys. Illnesses resulting from all of these causes are at their lowest level in adolescence and young adult ages. The only *major* cause which results in a higher rate of disability in young adult life than at any other age is the puerperal condition, and this, of course,

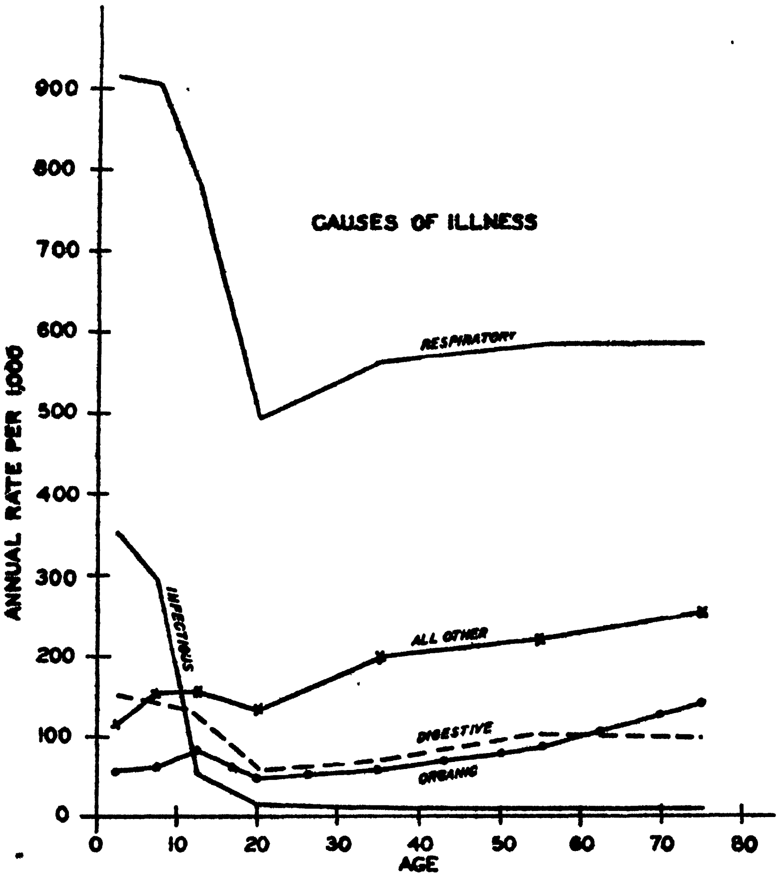

FIG. 2.—Causes of illness at different ages in a white population group in Hagerstown, Md., Dec. 1, 1921-Mar. 31, 1924. Under "infectious" diseases are included the "epidemic, endemic, and infectious diseases," and under "organic" the following. Diseases of the eyes, ears, circulatory system, teeth and gums, kidney, and genito-urinary system

relates to females only. Certain specific causes of illness do have their highest incidence in the young adult period of life, such as venereal diseases, typhoid fever, and pulmonary tuberculosis except under conditions of special strain or hazard. But, by and large, this is the age most free from illness from the great majority of causes.

Since the diagram we have been discussing (fig. 1) exhibits only the relative importance of the causes of illness at different ages, we

have plotted graphs in Figures 2 and 3 to show the actual variations in the illness rates from the major groups of causes. The importance of respiratory diseases and conditions as causes of illness is again emphasized; but their great height in childhood, their lowest level in adolescent and young adult periods (15–24 years), and their gradual rise with the advance of age are quite striking. They characterize illness in both extremes of life more than any other general disease group; although, with the exception of infectious diseases, circulatory

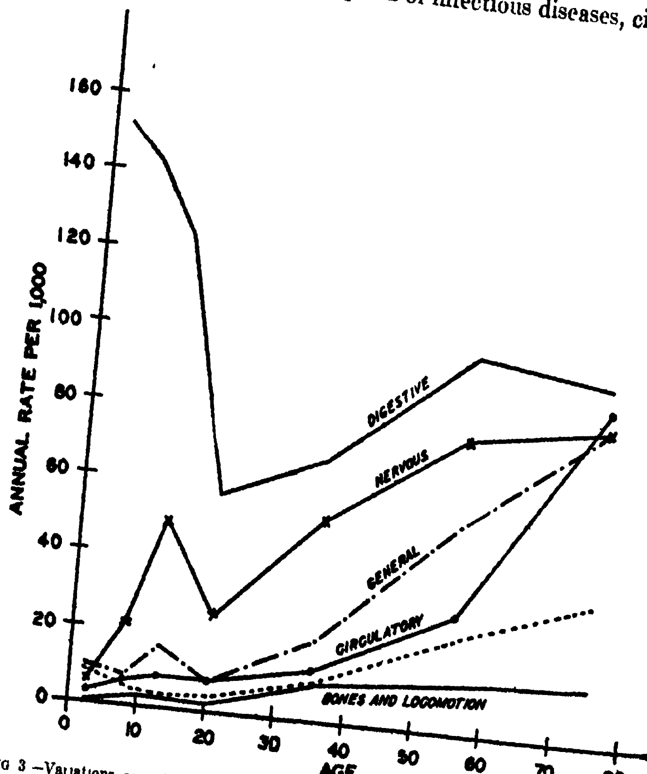

FIG 3.—Variations, according to age, of certain groups of diseases which were primary causes of illness in a white population group in Hagerstown, Md., Dec. 1, 1921–Mar. 31, 1924. The dotted line represents "diseases of the kidney and annexa."

diseases, and diseases of the bones and of "organs of locomotion"—which so clumsily describes diseases that affect certain muscles—nearly all of the major groups of causes of illness tend to appear among the very young and among the old.

In contrast to the organic troubles which so definitely begin to be manifested in middle life and which characterize old age, are the infections and the diseases and conditions affecting the skin, teeth, eyes, and ears (fig. 4) that occur with greatest frequency in childhood.

With this general view of the causes of illness at different ages, it is purposed to present in more detail in the next paper the age variations in the incidence of a number of specific diseases and conditions in so far as they were manifested in illness in the Hagerstown group.

ACKNOWLEDGMENTS

The continuous field observations upon which the foregoing report is based were made by the following assistants: F. Ruth Phillips,

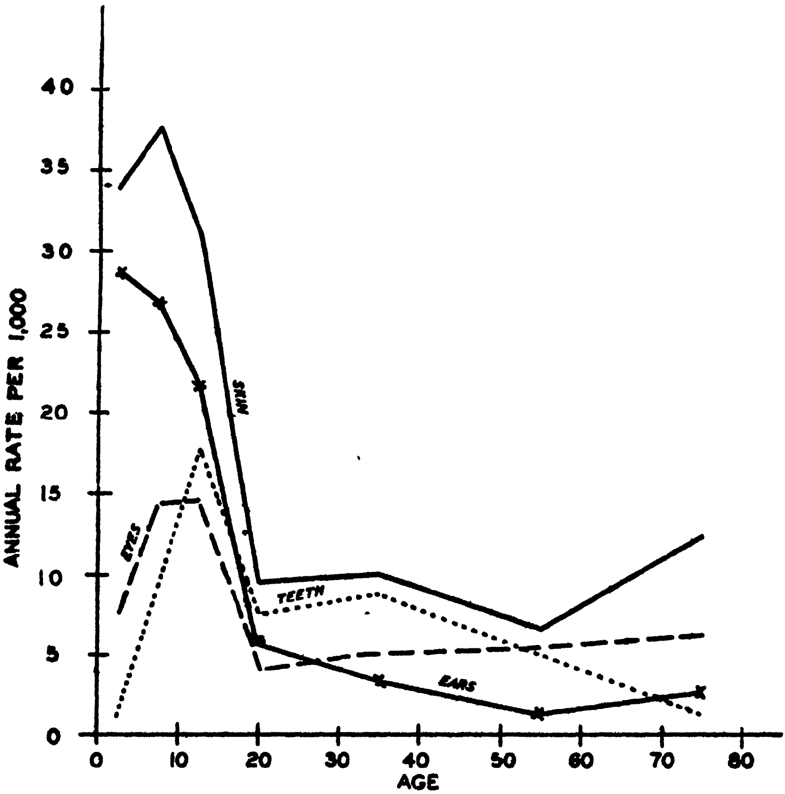

FIG 4.—Incidence, according to age, of diseases and conditions of the skin, teeth, eyes, and ears in a white population group in Hagerstown, Md., Dec. 1, 1921–Mar. 31, 1924

Mrs. Mary King Phillips, Louise Simmons, Mrs. Clara Bell Ledford, Clarice Buhrman, and Mrs. Alcesta Owen, under the immediate supervision of Passed Asst. Surg. R. B. Norment, jr., Acting Asst. Surg. A. S. Gray, and later, Surg. C. V. Akin.

In the analysis of the data I am especially indebted to Miss Phillips and to Associate Statistician S. D. Collins and Assistant Statistician Dorothy G. Wiehl, and other members of the statistical staff, as well as to several officers of the Public Health Service for constant advice on medical points.

WHOLE-TIME COUNTY HEALTH OFFICERS, 1928

The following directory has been compiled from data furnished as of January 1, 1928, by State health officers. Similar directories for the years 1922 to 1927, inclusive, have been published in the PUBLIC HEALTH REPORTS. The directory for 1927 was issued as Reprint No. 1164.

In the questionnaire sent for the purpose of obtaining the necessary information, a "whole-time" county health officer was defined as "one who does not engage in the practice of medicine or in any other business, but devotes all his time to official duties."

Directories of State health departments have been published annually by the Public Health Service for the years 1912 to 1927, inclusive. The directory for 1927 was issued as Reprint No. 1188 from the PUBLIC HEALTH REPORTS.

Directories of city health officers have been published annually for the years 1916 to 1927, inclusive, the directory for 1927 being Reprint No. 1177.

Directories of State and city health officers for 1928 will be published later.

State and county	Name of health officer	Post-office address	Official title
Alabama:			
Baldwin	G. C. Marlette, M. D.	Bay Minette	County health officer.
Barbour	E. M. Moore, M. D.	Clayton	Do.
Calhoun	G. A. Cryer, M. D.	Anniston	Do.
Chambers	C. W. McDonald, M. D.	Lafayette	Do.
Coffee	H. P. Rankin, M. D.	Elba	Do.
Colbert	W. T. Burkett, M. D.	Tuscumbia	Do.
Covington	R. B. Archibald, M. D.	Andalusia	Do.
Cullman	V. P. Hughes, M. D.	Cullman	Do.
Dale	W. S. Gilchrist, M. D.	Ozark	Do.
Dallas	L. T. Lee, M. D.	Selma	Do.
Elmore	A. H. Graham, M. D.	Wetumpka	Do.
Escambia	V. P. Roberts, M. D.	Brewton	Do.
Etowah	W. H. Harper, M. D.	Gadsden	Do.
Franklin	L. J. Graves, M. D.	Russellville	Do.
Houston	L. R. Poole, M. D.	Dothan	Do.
Jefferson	J. D. Dowling, M. D.	Birmingham	Do.
Lauderdale	W. D. Hubbard, M. D.	Florence	Do.
Lawrence	R. E. Harper, M. D.	Moulton	Do.
Lee	C. M. Moore, M. D.	Opelika	Do.
Limestone	L. R. Murphree, M. D.	Athens	Do.
Madison	W. C. Hatchett, M. D.	Huntsville	Do.
Marengo	J. R. Long, M. D.	Linden	Do.
Marshall	D. C. Jordan, M. D.	Guntersville	Do.
Mobile	C. A. Mohr, M. D.	Mobile	Do.
Monroe	T. E. Tucker, M. D.	Monroeville	Do.
Montgomery	J. L. Bowman, M. D.	Montgomery	Do.
Morgan	H. C. McRee, M. D.	Decatur	Do.
Pike	W. H Abernethy, M. D.	Troy	Do.
Sumter	J. S. Hough, M. D.	Livingston	Do.
Talladega	J. H. Hill, M. D.	Talladega	Do.
Tallapoosa	W. E. Wilson, M. D.	Dadeville	Do.
Tuscaloosa	A. A. Kirk, M. D.	Tuscaloosa	Do.
Walker	A. M. Waldrop, M. D.	Jasper	Do.
Arizona:			
Cochise	R. B. Durfee, M. D.	Bisbee	City and county health officer.
Coconino	G. F. Manning, jr., M. D.	Flagstaff	Do.
Yuma	Harry A. Reese, M. D.	Yuma	Do.
Arkansas:			
Ashley	M. F. Houston, M. D.	Hamburg	Medical director.
Chicot	W. D. Easterling, M. D.	Lake Village	Do.
Conway	W. H. Bruce, M. D.	Morrilton	Do.
Crittenden	J. T. Irby, M. D.	Marion	Do.
Cross	J. D. McKie, M. D.	Wynne	Do.

State and county	Name of health officer	Post-office address	Official title
Arkansas—Continued.			
Desha	J. C. Miller, M. D	McGehee	Medical director.
Drew	G. W. Jones, M. D	Monticello	Do.
Garland	J. F. Merritt, M. D	Hot Springs	Do.
Jackson	W. P. Moore, M. D	Newport	Do.
Jefferson	G. A. Hays, M. D	Pine Bluff	Do.
Little River	F. A. Norwood, M. D	Ashdown	Do.
Mississippi	A. M. Washburn, M. D	Blytheville	Do.
Monroe	A. J. Dunklin, M. D	Clarendon	Do.
Phillips	W. B. Bruce, M. D	Helena	Do.
Pope	A. B. Tate, M. D	Russellville	Do.
Pulaski	V. T. Webb, M. D	Little Rock	Do.
Saline	T. F. Ballard, M. D	Benton	Do.
Union	Gordon Hastings, M. D	El Dorado	Do.
Woodruff	J. F. Hays, M. D	McCrory	Do.
Yell	T. J. Pool, M. D	Ola	Do.
California:			
Los Angeles	J. L. Pomeroy, M. D	Los Angeles	County health officer.
Monterey	R. C. Main, M. D	Salinas	Do.
Orange	K. H. Sutherland, M. D	Santa Ana	Do.
Riverside	W. B. Wells, M. D	Riverside	Do.
San Diego	Alex M. Lesem, M. D	San Diego	Do.
San Joaquin	J. J. Sippy, M. D	Stockton	District health officer.
San Luis Obispo	Allen F. Gillihan, M. D	San Luis Obispo	County health officer.
Santa Barbara	F. G. Crandall, M. D	Santa Barbara	Do.
Yolo			
Colorado:			
Otero	Guy A. Ashbaugh, M. D	Rocky Ford	Do.
Connecticut:			
Fairfield	Lawrence E. Poole, M. D	Fairfield	Health officer and school physician.
Florida:			
Polk	W. M. Bevis, M. D	Bartow	County health officer.
Manatee	J. R. Scully, M. D	Sarasota	Do.
Sarasota	do	do	Do.
Georgia:			
Baldwin	S. A. Anderson, M. D	Milledgeville	Commissioner of health.
Bartow	D. H. Monroe, M. D	Cartersville	Do.
Bibb	J. D. Applewhite, M. D	Macon	Do.
Brooks	R. E. McClure, M. D	Quitman	Do.
Chatham	V. H. Bassett, M. D	Savannah	Do.
Clarke	B. B. Bagby, M. D	Athens	Do.
Cobb	J. E. Lester, M. D	Marietta	Do.
Coffee	T. H. Johnston, M. D	Douglas	Do.
Colquitt	T. B. Harper, M. D	Moultrie	Do.
Crisp	P. H. Smith, M. D	Cordele	Do.
Decatur	M. A. Fort, M. D	Bainbridge	Do.
De Kalb	J. R. Evans, Ph. G., M. D	Decatur	Do.
Dougherty	Hugo Robinson, Ph. G., M. D.	Albany	Do.
Floyd	B. V. Elmore, M. D	Rome	Do.
Glynn	H. L. Akridge, M. D	Brunswick	Do.
Hall	C. J. Wellborn, M. D	Gainesville	Do.
Laurens	O. H. Cheek, M. D	Dublin	Do.
Lowndes	G. T. Crozier, M. D	Valdosta	Do.
Mitchell	C. O. Rainey, M. D	Camilla	Do.
Richmond	Victor Roule, M. D	Augusta	Do.
Spalding	W. C. Humphries, M. D	Griffin	Do.
Sumter	W. H. Houston, M. D	Americus	Do.
Thomas	J. W. Wallace, M. D	Thomasville	Do.
Troup	S. C. Rutland, M. D	La Grange	Do.
Walker	J. H. Hammond, M. D	La Fayette	Do.
Ware	G. E. Atwood, M. D	Waycross	Do.
Washington			
Illinois:			
Cook	Herbert L. Wright, Ph. G., M. D., Dr. P. H.	Chicago, 737 South Lincoln.	Director of health.
Du Page	W. K. Murray, M. D	Wheaton	Health officer.
Morgan	W. H. Newcomb, M. D	Jacksonville	Do.
Kansas:			
Butler	R. J. Cabeen, M. D	Eldorado	County health officer.
Cherokee	C. C. Fuller, M. D	Columbus	Do.
Ellis	F. C. Cave, M. D	Hays	Do.
Geary	R. B. Stafford, M. D	Junction City	Do.
Greenwood	C. L. Miller, M. D	Eureka	Do.
Jefferson	G. D. M. Lambdin, M. D	Oskaloosa	Do.
Lyon	J. S. Fulton, M. D	Emporia	Do.
Marion	J. H. Saylor, M. D	Marion	Do.
Ottawa	C. R. Hepler, M. D	Minneapolis	Do.
Shawnee	F. E. McCord, M. D	Topeka	Do.
Kentucky:			
Ballard	G. L. Thompson, M. D	Wickliffe	Director, county health department.
Boyd	R. D. Higgins, M. D	Ashland	Do.
Breathitt	Luther Bach, M. D	Jackson	Do.

State and county	Name of health officer	Post-office address	Official title
Kentucky—Continued.			
Carlisle	R. K. Galloway, M. D.	Bardwell	Director, county health department.
Carter	G. E. Cecil, M. D.	Grayson	Do.
Daviess	R. M. Hathaway, M. D.	Owensboro	Do.
Elliott	P. L. Hawk, M. D.	Sandy Hook	Do.
Estill	J. W. Miller, M. D.	Irvine	Do.
Fayette	F. P. Allen, M. D.	Lexington	Do.
Floyd	Grant Rice, M. D.	Prestonsburg	Do.
Fulton	Hugh E. Prather, M. D.	Hickman	Do.
Henderson	F. C. Campbell, M. D.	Henderson	Do.
Hickman	Charles Hunt, M. D.	Clinton	Do.
Hopkins	M. E. Loftus, M. D.	Madisonville	Do.
Johnson	C. F. Holtegel, M. D.	Paintsville	Do.
Knott	J. W. Duke, M. D.	Hindman	Do.
Lawrence	W. L. Orr, M. D.	Louisa	Do.
Lee	Edwin Cameron, M. D.	Beattyville	Do.
Leslie	Daniel V. Sublett, M. D.	Hyden	Do.
Letcher	R. W. May, M. D.	Whitesburg	Do.
Magoffin	T. F. Long, M. D.	Salyersville	Do.
Martin	Wm. N. Keith, M. D.	Inez	Do.
Mason	J. H. Hutchings, M. D.	Maysville	Do.
McLean	J. S. Fitzhugh, M. D.	Calhoun	Do.
Menifee	E. T. Riley, M. D.	Frenchburg	Do.
Morgan	W. H. Wheeler, M. D.	West Liberty	Do.
Owsley	O. M. Goodloe, M. D.	Boonville	Do.
Perry	J. W. Davis, M. D.	Hazard	Do.
Pike			
Scott	A. Stewart, M. D.	Georgetown	Do.
Webster	Roy Orsburn, M. D.	Dixon	Do.
Wolfe	J. L. Cox, M. D.	Campton	Do.
Louisiana:[1]			
Assumption	T. G. Scott, M. D.	Napoleonville	Director of health.
Avoyelles	C. W. Strowger, M. D., C. P. H.	Marksville	Do.
Caddo	W. J. Sandidge, M. D.	Shreveport	Do.
Caldwell	W. R. King, M. D.	Columbia	Do.
Catahoula	J. R. Carter, M. D.	Harrisonburg	Do.
Claiborne	R. C. Farrier, M. D.	Homer	Do.
Concordia	R. H. Allen, M. D.	Vidalia	Do.
De Soto	R. A. Tharp, M. D.	Mansfield	Do.
East Carroll		Lake Providence	Do.
Franklin	N. C. Berry, M. D.	Winnsboro	Do.
Iberia	R. M. Primer, M. D.	New Iberia	Do.
Lafayette	D. C. Johnson, M. D.	Lafayette	Do.
Lafourche	H. S. Smith, M. D.	Thibodaux	Do.
La Salle	J. M. Kittrell, M. D.	Jena	Do.
Madison	L. R. Craig, M. D.	Tallulah	Do.
Morehouse	J. W. Williams, M. D.	Bastrop	Do.
Natchitoches	W. W. Knipmeyer, M. D.	Natchitoches	Do.
Ouachita	E. C. Edwards, M. D.	Monroe	Do.
Plaquemines			
Rapides	F. Klamke, M. D.	Alexandria	Do.
Richland	L. Treadway	Rayville	Do.
St. Martin	R. J. Gillespie, M. D.	St. Martinsville	Do.
St. Mary	F. E. Evans, M. D	Franklin	Do.
Tangipahoa	B. L. Stinson, M. D.	Amite	Do.
Tensas	N. P. Liles, M. D.	St. Joseph	Do.
Washington	John Schreiber, M. D.	Franklinton	Do.
Webster	E. B. Godfrey, M. D.	Minden	Do.
West Carroll	C. H. Tennet, M. D.	Oak Grove	Do.
Maine:[2]			
Motbov Union	H. L. Jackson, M. D.	Old Town	
Rumford	Thos. S. Burr, M. D.	Rumford	
Sanford	W. H. Kelly, M. D.	Sanford	
Vassalboro	A. R. Daviau, M. D.	Vassalboro	
Maryland:			
Allegany	C. C. McCulloch, M. D.	Cumberland	Deputy State health officer.
Baltimore	J. S. Bowen, M. D.	Towson	Do.
Calvert	I. N. King, M. D.	Prince Frederick	Do.
Carroll	W. C. Stone, M. D.	Westminster	Do.
Frederick	E. C. Kefauver, M. D.	Frederick	Do.
Montgomery	W. T. Pratt, M. D.	Rockville	Do.
Prince Georges	W. S. Keister, M. D.	Upper Marlboro	Do.
Talbot	C. A. Kane, M. D.	Easton	Do.
Massachusetts:			
Barnstable	A. P. Goff, M. D.	Hyannis	County health officer.
Minnesota:			
St. Louis	Gideon J. Ferreira, B. Sc., M. D.	Duluth	Do.

[1] Parishes. [2] Towns.

State and county	Name of health officer	Post-office address	Official title
Mississippi:			
Bolivar	R. D. Dedwylder, M. D.	Cleveland	Director of health.
Clarke	J. T. Googe, M. D.	Quitman	Do.
Coahoma	D. V. Galloway, M. D.	Clarksdale	Do.
Forrest	W. D. Beacham, M. D.	Hattiesburg	Do.
Hancock	C. M. Shipp, M. D.	Bay St. Louis	Do.
Harrison	D. J. Williams, M. D.	Gulfport	Do.
Hinds	W. E. Noblin, M. D.	Jackson	Do.
Holmes	B. D. Blackwelder, M. D.	Lexington	Do.
Humphreys	Paul S. Carley, M. D.	Belzoni	Do.
Issaquena	D. S. Johnson, M. D.	Mayersville	Do.
Jackson	R. G. Lander, M. D.	Pascagoula	Do.
Jones	W. B. Harrison, M. D.	Laurel	Do.
Lamar	C. H. Love, M. D.	Purvis	Do.
Lee	C. St. C. Guild, M. D.	Tupelo	Do.
Leflore	C. P. Coogle, M. D.	Greenwood	Do.
Pearl River	John W. Shackelford, M. D.	Poplarville	Do.
Perry	B. T. Robinson, M. D.	New Augusta	Do.
Sharkey	A. K. Barrier, M. D.	Rolling Fork	Do.
Sunflower	M. C. Balfour, M. D.	Indianola	Do.
Tishomingo	T. Paul Henry, jr., M. D.	Iuka	Do.
Union	C. M. Roberts, M. D. (Acting).	New Albany	Do.
Warren	F. M. Smith, M. D.	Vicksburg	Do.
Washington	A. J. Ware, M. D.	Greenville	Do.
Yazoo	W. W. Nesbit, M. D.	Yazoo City	Do.
Missouri:			
Boone	Finis Suggett, M. D.	Columbia	County health officer.
Dunklin	E. L. Spence, M. D.	Kennett	Do.
Greene	J. W. Williams, jr., M. D.	Springfield	Do.
Holt			
Jackson	J. T. Brennan, M. D.	Independence	Health Commissioner.
Marion	E. M. Lucke, M. D.	Hannibal	County health officer.
Mississippi	J. R. Lee, M. D.	Charleston	Do.
New Madrid	Wm. N. O'Bannon, M. D.	New Madrid	Do.
Nodaway	C. P. Fryer, M. D., D. P. H.	Maryville	Do.
Pemiscot	W. S. Petty, M. D.	Caruthersville	Do.
Pettis			
Scott	U. P. Haw, M. D.	Benton	Do.
St. Francois	W. W. Johnston, M. D.	Flat River	Do.
St. Louis	A. E. Walters, M. D.	Clayton	Health Commissioner.
Montana:			
Cascade	Thos. F. Walker, M. D.	Great Falls	County health officer.
Lewis and Clark	Arthur Jordan, M. D.	Helena	Do.
Missoula	F. D. Pease, M. D.	Missoula	Do.
New Mexico:			
Bernalillo	J. S. Scott, M. D.	Albuquerque	Do.
Chaves		Roswell	Do.
Dona Ana	C. W. Gerber, M. D.	Las Cruces	Do.
Eddy	O. E. Puckett, M. D.	Carlsbad	Do.
Santa Fe	H. P. Mera, M. D.	Santa Fe	Do.
Union	C. H. Douthirt, M. D.	Clayton	Do.
Valencia	P. H. McNellis, M. D.	Los Lunas	Do.
New York:			
Cattaraugus	R. M. Atwater, M. D., D. P. H.	Olean	Acting County health officer.
North Carolina:			
Beaufort	John W. Williams, M. D.	Washington	County health officer.
Bertie	J. E. Smith, M. D.	Windsor	Do.
Bladen	R. S. Cromartie, M. D.	Elizabethtown	Do.
Brunswick	R. E. Broadway, M. D.	Southport	Do.
Buncombe	G. A. Morgan, M. D.	Asheville	Do.
Cabarrus	D. G. Caldwell, M. D.	Concord	Do.
Carteret	T. C. Britt, M. D.	Beaufort	Do.
Columbus	Floyd Johnson, M. D.	Whiteville	Do.
Craven	D. E. Ford, M. D.	New Bern	Do.
Cumberland	J. W. McNeill, M. D.	Fayetteville	Do.
Davidson	G. C. Gambrell, M. D.	Lexington	Do.
Durham	J. H. Epperson, M. D.	Durham	Do.
Edgecombe	A. C. Norfleet, M. D.	Tarboro	Do.
Forsyth	J. R. Hege, M. D.	Winston-Salem	Do.
Granville	J. A. Morris, M. D.	Oxford	Do.
Guilford	R. M. Buie, M. D.	Greensboro	Do.
Halifax	Z. P. Mitchell, M. D.	Weldon	Do.
Henderson	J. H. Woodcock, M. D.	Hendersonville	Do.
Johnston	C. C. Massey, M. D.	Smithfield	Do.
Lenoir	R. S. McGeachy, M. D.	Kinston	Do.
Mecklenburg	W. A. McPhaul, M. D.	Charlotte	Do.
Nash	G. F. Reeves, M. D.	Nashville	Do.
New Hanover	John H. Hamilton, M. D.	Wilmington	Do.
Northampton	M. H. Scawell, M. D.	Jackson	Do.
Pamlico	D. A. Dees, M. D.	Bayboro	Do.

State and county	Name of health officer	Post-office address	Official title
North Carolina—Contd.			
Pitt	W. E. Futrell, M. D	Greenville	County health officer.
Richmond	A. B. McCreary, M. D	Rockingham	Do.
Robeson	E. R. McHardin, M. D	Lumberton	Do.
Rowan	C. W. Armstrong, M. D	Salisbury	Do.
Rutherford	J. C. Twitty, M. D	Rutherfordton	Do.
Sampson	John D. Kerr, M. D	Clinton	Do.
Surry	G. H. Sumner, M. D	Mount Airy	Do.
Vance	F. R. Harris, M. D	Henderson	Do.
Wake	A. C. Bulla, M. D	Raleigh	Do.
Wayne	L. W. Corbett, M. D	Goldsboro	Do.
Wilkes	J. W. White, M. D	Wilkesboro	Do.
Wilson	L. J. Smith, M. D	Wilson	Do.
Ohio:			
Allen	J. J. Sutter, M. D	Lima	District health commissioner.
Ashtabula	W. S. Weiss, M. D	Jefferson	Do.
Belmont	F. R. Dew, M. D	St. Clairsville	Do.
Butler	C. J. Baldridge, M. D	Hamilton	Do.
Claremont	F. A. Ireton, M. D	Batavia	Do.
Clinton	W. K. Ruble, M. D	Wilmington	City and county health officer.
Columbiana	T. T. Church, M. D	Lisbon	Do.
Coshocton	D. M. Criswell, M. D	Coshocton	Do.
Crawford	G. T. Wasson, M. D	Bucyrus	District health commissioner.
Cuyahoga	Robert Lockhart, M. D	Cleveland	City and county health officer.
Darke	Milford E. Barnes, M. D	Greenville	Do.
Delaware	B. B. Barber, M. D	Ashley	District health commissioner.
Erie	F. M. Houghtaling, M. D	Sandusky	City and county health officer.
Fayette	James F. Wilson, M. D	Washington Court House.	Do.
Franklin	P. B. Wiltberger, M. D	Columbus	District health commissioner.
Geauga	Walter Corey, M. D	Chardon	Do.
Hamilton	C. A. Neal, M. D	Cincinnati	Do.
Hancock	S. F. Whisler, M. D	Findlay	Do
Hocking	E. R. Hiatt, M. D	Logan	City and county health officer.
Huron	B. C. Pilkey, M. D	Norwalk	District health commissioner.
Jefferson	J. P. Young, M. D	Steubenville	Do.
Lake	Walter Corey, M. D	Painesville	Do.
Lorain	C. D. Barrett, M. D	Oberlin	Do.
Lucas	F. F. DeVore, M. D	Toledo	Do.
Mahoning	J. F. Elder, M. D	Youngstown	Do.
Marion	N. Sifritt, M. D	Marion	Do.
Meigs	Jane Nye Gilliford, M. D	Pomeroy	Do.
Mercer	F. E. Ayers, M. D	Celina	Do.
Miami	P. J. Crawford, M. D	Troy	City and county health officer.
Montgomery	H. H. Pansing, M. D	Dayton	District health commissioner.
Morrow	R. L. Pierce, M. D	Mount Gilead	Do.
Muskingum	J. M. O'Neal, M. D	Zanesville	Do.
Perry	F. J. Crosbie, M. D	New Lexington	Do.
Preble	H. Z. Silver, M. D	Eaton	Do.
Richland	Charles L. Shaver, M. D	Mansfield	City and county health officer.
Ross	R. E. Bower, M. D	Chillicothe	Do.
Sandusky	O. H. Thomas, M. D	Fremont	District health commissioner.
Scioto	R. W. DeCrow, M. D	Wheelersburg	Do.
Seneca	J. J. Heaton, M. D	Tiffin	Do.
Shelby	B. S. Stephenson, M. D	Sidney	City and county health officer.
Stark	Chester M. Peters, M. D	Canton	District health commissioner.
Summit	R. H. Markwith, M. D	Akron	City and county health officer.
Trumbull	L. A. Connell, M. D	Warren	District health commissioner.
Tuscarawas	J. Blickensderfer, M. D	New Philadelphia	City and county health officer.
Washington	Alfred G. Sturgiss, M. D	Marietta	District health commissioner.
Wayne	W. G. Rhoten, M. D	Wooster	City and county health officer.
Wood	H. J. Powell, M. D	Bowling Green	Do.

State and county	Name of health officer	Post-office address	Official title
Oklahoma:			
Carter	John L. Dorough, M. D.	Ardmore	County superintendent of health.
Kay	David M. Cowgill, M. D.	Newkirk	Do.
Leflore	W. F. Lunsford, M. D.	Poteau	Do.
McCurtain	R. D. Williams, M. D.	Idabel	Do.
Muskogee	Carl F. Jordan, M. D., C. P. H.	Muskogee	Do.
Okmulgee	J. O. Walls, M. D.	Okmulgee	Do.
Ottawa	Fred P. Helm, M. D.	Miami	Do.
Pittsburg	Chas. M. Pearce, M. D.	McAlester	Do.
Seminole	George Hunter, M. D.	Wewoka	Do.
Oregon:			
Clackamas	W. H. Miller, M. D.	Oregon City	County health officer
Coos	P. M. Drake, M. D.	Coquille	Do.
Douglas	T. W. Laraway, M. D.	Roseburg	Do.
Jackson	L. D. Inskeep, M. D.	Medford	Do.
Klamath	G. S. Newsom, M. D.	Klamath Falls	Do.
Marion	Vernon Douglas, M. D.	Salem	Do.
Multnomah	H. R. Cliff, M. D.	Portland	Do.
South Carolina:			
Aiken	W. G. Bodie, M. D.	Aiken	Do.
Anderson	E. E. Epting, M. D.	Anderson	Do.
Beaufort	H. B. Senn, M. D.	Beaufort	Do.
Charleston	Leon Banov, M. D.	Charleston	Do.
Cherokee	P. H. Smith, M. D.	Gaffney	Do.
Darlington	A. B. Hooton, M. D.	Darlington	Do.
Dillon	C. C. Freed, M. D.	Dillon	Do.
Fairfield	H. T. Kennedy, M. D.	Minnsboro	Do.
Georgetown	Clem Ham, M. D.	Georgetown	Do.
Greenville	Bayliss Earle, M. D.	Greenville	Do.
Greenwood	Robert D. Hill, M. D.	Greenwood	Do.
Horry	G. S. T. Peeples, M. D.	Conway	Do.
Marion	R. L. Martin, M. D.	Marion	Do.
Newberry	H. G. Callison, M. D.	Newberry	Do.
Orangeburg	G. C. Bolin, M. D.	Orangeburg	Do.
Spartanburg	L. L. Williams, M. D.	Spartanburg	Do.
South Dakota:			
Pennington	A. N. Crain, M. D.	Rapid City	Do.
Tennessee:			
Blount	K. A. Bryant, M. D.	Maryville	Director of health.
Bradley	H. M. Roberson, M. D.	Cleveland	County health officer.
Davidson	J. J. Lentz, M. D.	Nashville	Do.
Dyer	Owen F. Agee, M. D.	Dyersburg	Do.
Gibson	F. L. Roberts, M. D.	Trenton	Do.
Hamilton	J. C. Eldridge, M. D.	Chattanooga	Do.
Lake	James P. Moon, M. D.	Tiptonville	Director of health.
Lauderdale	John E. Cunning, M. D.	Ripley	County health officer.
Montgomery	F. J. Malone, M. D.	Clarksville	Do.
Obion	C. B. A. Turner, M. D.	Union City	Do.
Roane	J. C. Fly, M. D.	Kingston	Do.
Rutherford	H. S. Mustard, M. D.	Murfreesboro	Do.
Sevier	C. S. Kinzer, M. D.	Sevierville	Director of health.
Shelby	L. M. Graves, M. D.	Memphis	County health officer.
Washington	S. S. Moody, M. D.	Jonesboro	Director of health.
Weakley	M. D. Ingram, M. D.	Dresden	County health officer.
Williamson	W. C. Williams, M. D.	Franklin	Do.
Texas:			
Cameron	Ernest W. Prothro, M. D.	San Benito	Do.
Hidalgo	J. R. Mahone, M. D.	Edinburg	Do.
McLennan	R. McCormick, M. D.	Waco	Do.
Tarrant	F. P. Smith, M. D.	Fort Worth	Do.
Utah:			
Box Elder	R. H. Wilson, M. D.	Brigham City	Do.
Davis	Sumner Gleason, M. D.	Kaysville	Do.
Summit	R. O. Johnson, M. D.	Park City	District health officer.
Utah	L. L. Cullimore, M. D.	Provo	County health officer
Wasatch	R. O. Johnson, M. D.	Park City	District health officer.
Virginia:			
Accomac	F. J. Wampler, M. D.	Accomac	County health officer.
Albemarle	G. B. Young, M. D.	Charlottesville	Do.
Arlington	P. M. Chichester, M. D.	Clarendon	Do.
Augusta	H. M. Wallace, M. D.	Staunton	Do.
Brunswick	E. L. McQuade, M. D.	Laurenceville	Do.
Halifax	Kolbe Curtice	South Boston	Do.
Henrico	W. H. Pott, M. D.	Richmond	Do.
Isle of Wight	J. B. Woods, M. D.	Smithfield	Do.
Nansemond	C. H. Dawson, M. D.	Suffolk	Do.
Norfolk	I. C. Riggin, M. D.	Portsmouth	Do.
Northampton	F. J. Wampler, M. D.	Accomac	Do.
Princess Anne	I. C. Riggin, M. D.	Portsmouth	Do.
Rockbridge	R. P. Cooke, M. D.	Lexington	Do.
Southampton	A. L. McLean, M. D.	Courtland	Do.

State and county	Name of health officer	Post-office address	Official title
Washington:			
Chelan	Paul West, M. D	Wenatchee	County health officer.
King	C. L. Dixon, M. D	Seattle	Do.
Snohomish	H. M. Berge, M. D	Everett	Do.
Spokane	W. M. Newman, M. D	Spokane	Do.
Walla Walla	Geo. H. T. Sparling, M. D.	Walla Walla	Do.
Whitman	R. J. Skaife, M. D	Colfax	Do.
Yakima	H. Storgaard, M. D	Yakima	Do.
West Virginia:			
Berkeley	W. Ross Cameron, M. D.	Martinsburg	Do.
Boone	G. W. Luckey, M. D	Madison	Do.
Brooke	W. J. McDonald, M. D.	Wellsburg	Do.
Gilmer	A. L. Oilar, M. D	Glenville	Do.
Hancock	A. E. McClure, M. D	New Cumberland	Do.
Harrison	V. A. Selby, M. D., D. P. H.	Clarksburg	Do.
Kanawha	John Thames, M. D	Charleston	Do.
Lewis	H. B. Neagle, M. D	Weston	Do.
Logan	P. B. Wingfield, M. D	Logan	Do.
Marion	H. M. Batson, M. D	Fairmont	Do.
Marshall	J. H. McCall, M. D	Moundsville	Do.
Ohio	W. H. McLain, M. D	Wheeling	Do.
Preston	L. H. Lewis, M. D	Kingwood	Do.
Wood	T. R. Meyer, M. D	Parkersburg	Do.
Wyoming:			
Natrona	H. Garst, M. D	Casper	Director of health.

UNIVERSITY OF MICHIGAN SUMMER COURSES IN PUBLIC HEALTH

The University of Michigan offers two groups of courses in hygiene and public health during the coming summer session, which is to be held this year from June 25 to August 3.

The public health training courses will include the following subjects:

(*a*) General hygiene and public health.
(*b*) Child hygiene.
(*c*) School hygiene.
(*d*) Methods and materials in health education.
(*e*) Communicable diseases and epidemiology.
(*f*) Nutrition.
(*g*) Public health nursing.
(*h*) Mental hygiene and psychiatry.
(*i*) Vital statistics.
(*j*) Tuberculosis.
(*k*) Organization and administration of health education.

Many other courses will be offered which will be of interest and value to public health workers. These will include biology, chemistry, bacteriology, sociology, education, psychology, and medicine.

The course in tuberculosis should prove to be of particular interest to all persons engaged in antituberculosis work. The nursing, medicosocial, and community aspects of tuberculosis will be considered. The course will be conducted by several of our leading specialists in tuberculosis.

In addition to the above, a special Public Health Institute will be conducted on Friday and Saturday of each week during the summer

session. This institute is arranged primarily for those who are engaged in public health activities and find it impossible to leave their work for the six weeks of the regular summer session, but can arrange to get away from their labors for two days each week. It consists of six class periods on each Friday and Saturday for six weeks—making a total of 72 class periods. The class periods are arranged to cover the various fields of public health.

PUBLIC HEALTH ENGINEERING ABSTRACTS

First Principles in Sewage Disposal. F. C. Temple. *The Surveyor*, vol. 73, No. 1883, February 24, 1928, p. 259. (Abstract by H. W. Streeter.)

A reply to discussions of Mr. Temple's paper, presented at the Public Works, Roads, and Transport Congress at London in November, 1927. Mr. Temple points out the differences existing in the conditions affecting the operation of storm-water tanks in tropical countries, as compared with more temperate climates. In the former case, tanks may be made smaller, but must be filled with clean water between rainy periods in order to provide sufficient capacity for extremely heavy flushings of solid matter accompanying the first tropical rains following long droughts. As regards damage caused by trade wastes, he draws a parallel to aerial nuisances, which are controlled by law. He discusses the standardization of terms defining the relative strength of sewage, noting that an Indian "strong" sewage is stronger than any British sewage, which, in turn, is stronger than American sewage.

Methods Used by Oil Company Stop Pollution of Streams. Charles W. Geiger. *Water Works Engineering*, vol. 81, No. 2, January 18, 1928, p. 90. (Abstract by Frank Raab.)

At the El Segundo refinery, the Standard Oil Co. of California pumps about 20,000,000 gallons of salt water daily from the ocean. The water is used for cooling purposes in the refining of oil. In its way through the refinery the water picks up a certain amount of oil from leaks, spills, etc. The oil is about one-tenth of 1 per cent of the volume of water used. This oil is removed from the water before the latter is returned to the ocean. The article describes the method used in separating the oil and water by passing it through a tank or series of tanks or compartments and over skimming baffles in an action which keeps the water and oil moving toward the surface, thus assisting and accelerating the movement of the oil to the surface where it is pumped off. The above plant removes all traces of oil from the water.

Deep-Pit Sludge Digestion at Indianapolis Sewage Works. C. K. Calvert. *Engineering News-Record*, vol. 100, No. 6, February 9, 1928, pp. 230–231. (Abstract by C. H. Kibbey.)

Sludge containing 7.72 and 1.12 per cent solids, respectively, is pumped to digestion pits. Pits are about 300 feet square, with a depth of 7 to 10 feet. The nature of the soil beneath the pits permits water to escape to such extent that it is only occasionally necessary to remove any quantity of free water, although skimming boxes are provided for the removal of liquor at any depth.

No chemical or temperature control is provided. A pit receives sludge until it is full, and the flow is then diverted to another pit until the level of the sludge in the first pit is lowered by filtration into the ground. This brings about a series of intermittent fillings and effects some seeding. During filling periods, pits become more acid, especially in cold water.

Primary sludge enters the pit at a pH of about 6.8 and the activated sludge at 7.3. Under normal filling conditions the mixed sludge seldom drops during digestion below 6.8, and, on standing, without the addition of fresh sludge, goes to 7.8 and 8 in a short time. Above figures indicate conditions under which digestion usually takes place, but hard and fast reaction and time figures can not be given. Relative amounts of fresh and digested sludge and the temperature govern the rate of reaction change.

A tabulation showing figures obtained in taking stock of sludge in the various pits is given. The large reduction in volume is attributed to the nature of the soil underlying the pits and the extent of digestion of solids to the long period of time involved, although the method of filling produces a mixture of some very old and some very fresh sludge in each pit. The mixture has never drained to less than 80 per cent of moisture, and for the most part a moisture content of about 85 per cent obtains.

The author believes that, as the proportion of activated sludge increases, satisfactory draining becomes more difficult and that drying beds will be required to put sludge in a condition to be handled. The present use of sludge by growers has not solved the problem of disposal, but its use may be developed and extended as growers become familiar with its advantages.

Water Supply, Sewage Treatment, and Refuse Disposal in 1927. H. B. Cleveland. Public Works, vol. 59, No. 1 January, 1928, pp. 14–18. (Abstract by R. J. Faust.)

Sewage treatment.—The year 1927 has marked a decided increase in interest on the part of the general public in sewage treatment in eliminating stream pollution. This resulted in the enactment of State laws providing for joint sewer districts, for assessment of sewage-disposal costs as a utility, and for legislative and departmental investigation of stream pollution problems.

Major plants completed, under construction, or planned are as follows: North Side, West Side, and Southwest Side plants at Chicago; a $20,000,000 Imhoff tank plant for Detroit has been recommended and approved; a Metropolitan Drainage Commission has been appointed to work out plans for joint sewage treatment for St. Paul and Minneapolis. An increasing favor toward separate sludge digestion is noted for smaller plants.

The principal studies on research on which conclusions were reached are as follows: (1) Hydrogen sulphide production, with particular reference to the effects of unfiltered sea water; (2) the effect of comparatively small amounts of chlorides (as found in sea water) is slight; (3) sewage screenings contain comparatively large quantities of carbonaceous materials, but may be digested rapidly under proper conditions; (4) all fats may eventually be digested, but not necessarily within economic limits; (5) at the optimum temperature of 80° F., the permissible daily addition of fresh solids to ripe sludge may be increased to 3.25 per cent, as against 2 per cent at 70° F.; (6) The average time of digestion in separate sludge digestion taken at Plainfield, N. J., was 40 days at a temperature of 67°–68° F., average pH value was 7.3; (7) more than 75 substances were tried as possible filter fly controls, but none proved satisfactory.

Treatment of London Sewage. Anon. *The Surveyor*, vol. 73, No. 1883, February 24, 1928, p. 271. (Abstract by H. W. Streeter.)

The London County Council Main Drainage Committee have submitted proposals for the installation at the northern outfall works, at Barking, of a plant for the treatment of sewage by the activated sludge process, estimated to cost about $1,250,000. The plant is intended to deal with 5 to 10 m. g. d. out of a total of 258 m. g. d. After experience of the proposed installation, further works are contemplated. The average daily quantity of effluent discharged from the

northern outfall is 164 m. g. d., and from the southern outfall, 94 m. g. d. Dilution is provided mainly by the Thames and its tributaries, only a small volume of tidal waters being considered as available for this purpose. Other effects of the tide are, however, favorable, including (*a*) the spreading of polluted water over a long stretch of purer water, (*b*) facilitation of atmospheric reaeration of the water caused by its movement, and (*c*) the prevention of formation of permanent undisturbed fermenting mud banks. Further natural factors modifying aeration are area of water surface, depth, temperature, air humidity, salinity, wind, etc.

Investigation and Research. Anon. Thirteenth Annual Report of the Bureau of Sewage Disposal, City of Schenectady, New York, 1927, pp. 9–10. (Abstract by W. L. Havens.)

During the winter of 1926–27 an investigation was carried out to ascertain the effect of chlorination of the raw sewage, prior to settling-tank treatment. Chlorine was added at rates varying from 6 to 2 p. p. m., with the result that no residual chlorine was found in the tanks during the study. No bacterial reduction in the tank effluent was obtained and no deleterious effect was produced by gas treatment. Odor conditions were excellent about the plant during the entire summer; and during cooler weather, rates of application of about 1 p. p. m. produced the desired results. Liming of the Imhoff tanks was practiced, with the intention of starting pH control. In addition, a river survey was begun in order to determine the necessity of formulating plans for the treatment of the balance of the sewage flow of the city which is now entering the river untreated.

Rivers Pollution Prevention Work of the West Riding Board. Anon. *The Surveyor*, vol. 73, No. 1883, February 24, 1928, p. 260. (Abstract by H. W. Streeter.)

The remarkable improvement effected during the past 30 years in the condition of streams in the West Riding of Yorkshire as the result of the work of the West Riding Rivers Board is demonstrated in a special report by the Board's chief inspector, Dr. H. M. Wilson.

The streams, with tributaries, under survey of the board had a total length of over 2,000 miles, including some clean rivers, and others in various states of pollution. There are now 427 sewage works in the board's area, as compared with 167 in 1896. Many works, however, have been abolished, with the process of concentration still going on.

Only those who remember the condition of the streams 20 or 30 years ago, concludes Doctor Wilson, and those who realize the great addition to the total volume of sewage since then, could have any conception of the foul state in which the streams would have been at present had it not been for the work of the board. Pollution of the cleaner streams has been dealt with at an early stage, preventing deterioration already begun.

The Ozone Fallacy in Garage Ventilation. Carroll M. Salls. *Journal of Industrial Hygiene*, vol. 9, No. 12, December, 1927, pp. 503–511. (Abstract by Leonard Greenburg.)

Doctor Salls presents a discussion of the literature concerned with the reaction of carbon monoxide and ozone, and from this discussion one must conclude that there is great variance in the literature concerned with this reaction.

The experimental studies presented are analyses of the atmosphere from a gassing chamber in which carbon monoxide is mixed with ozone at room temperature. The atmosphere was sampled from the beginning of the mixture of the gases through a period 140 minutes thereafter. The carbon monoxide determinations were made by means of the Sayers-Yant method, using defibrinated steer's blood as a blood reagent. Three samples of the atmosphere were obtained prior to starting the ozonator, the three samples yielding the following results in chronological order: 13, 9, and 7 parts of carbon monoxide. After allowing the ozonator to

operate for about 20 minutes a sample was taken which yielded somewhat less than 5 parts of carbon monoxide. Subsequent samples were taken to the end of 140 minutes. When these samples were plotted against time, they fell on a fairly uniform curve which appears to be the curve of absorption of gas by the chamber walls and leakage through them. The starting of the ozonator appears to have altered the shape of the curve in no way.

Doctor Salls concludes that this study indicated no evidence of an appreciable action of the ozone on the carbon monoxide.

Preventing Excessive Smoke. J. F. Bjorkholm. *Railway Age*, vol. 84, No. 6, February 11, 1928, pp. 357–359. (Abstract by Leonard Greenburg.)

One of the most important discriminations in the field of smoke abatement, so far as railroading is concerned, is the differentiation between smoke prevention and "smoke painting" or whitewashing. The latter is merely a method of decoloring smoke by means of wet steam or vapor, whereas the former, the correct method, requires improved combustion. The author further points out that smoke burning or smoke combustion are misnomers, because smoke already formed ordinarily can not be burned or consumed. The greatest difficulty in avoiding smoke is usually on switch or transfer engines, owing to the nature of their work, and on road engines starting out from their terminal. Here it is necessary to rely on the blower and "smoke burner," by means of which additional air is admitted to the fire box, this air serving to prevent the formation of smoke. When the steam jets are used in the fire box without inducing the flow of additional air into the fire box, the steam jets merely serve to paint the smoke and not to prevent it.

In addition to this generous supply of air, a sufficiently high fire-box temperature is necessary to prevent smoke formation. And, lastly, it is to be pointed out that the proper method of firing has considerable influence on smoke formation. Only a sufficient amount of fuel should be placed in the fire box at each firing to insure proper combustion.

Atmospheric Diffusion of Paris Smokes. Kohn-Abrest. Compt. rend. 185, 617–20 (1927). (Abstract by L. W. Riggs in *Chemical Abstracts*, vol. 22, No. 3, February 10, 1928, p. 473.)

"Samples of air taken at the base and at elevations of 57, 115, and 288 m. of the Eiffel Tower were analyzed. The quantity of CO_2 was about the same except at 288 m., where it was larger than at any of the lower levels. CO was absent at the base and at 288 m ; it was largest in amount at 115 m."

A New Larvicide for Mosquitoes. Robert Matheson and G. H. Hinman. *American Journal of Hygiene*, vol. 8, No. 2, March, 1928, pp. 293–296. (Abstract by L. L. Williams, jr.)

The authors experimented with chemically pure borax, with crystalline and calcined sodium borate, and with commercial borax. The latter was found to be as efficient as any. After experimenting with various concentrations, the authors conclude that ordinary borax in the concentration of 1.5 grams per liter of water proved an efficient larvicide for mosquito larvæ. This retains its action for long periods of time in wooden pails. Borax did not stop egg laying and hatching, but in no case did the young larvæ live for more than two days.

They quote reports that borax pools do not produce mosquitoes and that, in a borax country, this substance is not absorbed into the ground, but crystallizes on evaporation of the water and is ready for the next rain. The authors suggest that there is a field of usefulness for borax as a larvicide in such places as fire barrels, etc.

Water Supply, Sewage Treatment, and Refuse Disposal in 1927. H. B. Cleveland. *Public Works*, vol. 59, No. 1, January, 1928, pp. 14–18. (Abstract by R. J. Faust.)

DEATHS DURING WEEK ENDED APRIL 21, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended April 21, 1928, and corresponding week of 1927. (From the Weekly Health Index, April 25, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Apr. 21, 1928	Corresponding week, 1927
Policies in force	70, 998, 155	67, 421, 189
Number of death claims	15, 838	13, 589
Death claims per 1,000 policies in force, annual rate	11. 7	10. 5

Deaths from all causes in certain large cities of the United States during the week ended April 21, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, April 25, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Apr. 21, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Apr. 21, 1928[2]
	Total deaths	Death rate[1]		Week ended Apr. 21, 1928	Corresponding week, 1927	
Total (66 cities)	8, 593	15. 0	14. 0	917	807	75
Akron	52			6	5	65
Albany[3]	42	18. 2	18. 8	1	3	20
Atlanta	83	17. 0	12. 6	15	7	
White	40		9. 8	5	4	
Colored	43	(4)	19. 1	10	3	
Baltimore[3]	258	16. 2	16. 6	27	24	86
White	198		14. 1	17	16	68
Colored	60	(4)	30. 7	10	8	157
Birmingham	69	16. 2	16. 5	4	11	34
White	27		13. 0	2	5	28
Colored	42	(4)	22. 2	2	6	45
Boston	258	16. 9	16. 5	49	31	136
Bridgeport	33			2	3	37
Buffalo	144	13. 5	14. 2	17	10	73
Cambridge	24	10. 0	14. 3	4	3	71
Camden	24	9. 8	19. 6	0	7	0
Canton	22	9. 8	11. 0	1	2	24
Chicago[3]	854	14. 1	12. 3	83	87	71
Cincinnati	149	18. 8	19. 4	15	19	91
Cleveland	214	11. 1	11. 0	29	23	79
Columbus	83	14. 6	18. 4	6	15	56
Dallas	51	12. 3	8. 6	4	2	
White	38		7. 4	2	2	
Colored	13	(4)	17. 1	2	0	
Denver	83	14. 8	14. 9	7	8	
Des Moines	45	15. 5	13. 3	3	3	50
Detroit	373	14. 1	13. 6	67	52	103
Duluth	27	12. 1	10. 5	2	1	47
El Paso	55	24. 4	17. 9	12	4	
Erie	20			1	2	21
Fall River[3]	24	9. 8	11. 0	6	3	103
Flint	27	9. 5	8. 8	7	6	89
Fort Worth	38	11. 8	14. 3	6	7	
White	31		13. 4	5	7	
Colored	7	(4)	21. 3	1	0	
Grand Rapids	50	15. 9	11. 9	5	8	75
Houston	71			9	7	
White	53			7	6	
Colored	18	(4)		2	1	
Indianapolis	94	12. 9	13. 2	5	5	38
White	75		12. 5	5	3	44
Colored	19	(4)	18. 6	0	2	0
Jersey City	88	14. 2	13. 6	11	9	82

[1] Annual rate per 1,000 population.

[2] Deaths under 1 year per 1,000 births. Cities left bank are not in the registration area for births.

[3] Deaths for week ended Friday, Apr. 20, 1928.

[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended April 21, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, April, 25, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Apr. 21, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Apr. 21, 1928
	Total deaths	Death rate		Week ended Apr. 21, 1928	Corresponding week, 1927	
Kansas City, Kans	27	11.9	12.4	0	5	0
White	21		10.3	0	3	0
Colored	6	(4)	22.1	0	2	0
Kansas City, Mo	113	15.1	12.0	9	5	64
Knoxville	25	12.4	10.2	1	1	22
White	15		10.4	1	1	24
Colored	10	(4)	8.5	0	0	0
Los Angeles	270			27	27	77
Lowell	29	13.7	13.2	4	3	84
Lynn	29	14.4	15.9	4	3	101
Memphis	91	25.0	18.7	6	10	70
White	41		12.2	4	3	75
Colored	50	(4)	30.4	2	7	63
Milwaukee	148	14.2	11.7	17	20	76
Minneapolis	132	15.1	12.8	14	12	84
Nashville	75	28.3	17.4	6	4	94
White	44		15.3	4	3	85
Colored	31	(4)	22.8	2	1	120
New Bedford	29	12.7	11.8	7	4	152
New Haven	73	20.3	11.8	9	2	127
New Orleans	162	19.7	15.1	11	11	53
White	92		10.5	5	6	36
Colored	70	(4)	28.4	6	5	87
New York	1,856	16.1	13.8	196	159	79
Bronx Borough	218	12.0	11.3	18	20	54
Brooklyn Borough	613	13.9	11.9	72	50	72
Manhattan Borough	795	23.7	19.8	88	69	104
Queens Borough	178	10.9	9.3	13	17	52
Richmond Borough	52	18.0	11.4	5	8	90
Newark, N. J	134	14.8	12.1	10	11	67
Oklahoma City	34				3	
Omaha	63	14.8	11.7	9	5	104
Paterson	34	12.3	17.4	5	3	87
Philadelphia	609	15.4	16.1	50	53	67
Pittsburgh	213	16.6	14.4	27	15	88
Portland, Oreg	69			4	5	43
Providence	78	14.2	14.1	8	4	70
Richmond	59	15.9	17.4	3	7	39
White	31		16.8	0	2	0
Colored	28	(4)	18.8	3	5	110
Rochester	99	15.8	15.3	6	8	49
St. Louis	234	14.4	13.4	23	26	77
St. Paul	69	14.3	13.3	8	5	77
Salt Lake City [3]	39	14.8	15.0	6	2	98
San Antonio	80	19.2	19.7	19	11	
San Diego	35	15.3	20.4	1	2	19
San Francisco	151	13.5	15.4	6	10	38
Schenectady	20	11.2	9.0	2	3	63
Seattle	81	11.1	9.4	4	3	41
Somerville	28	14.3	9.2	6	1	207
Spokane	24	11.5	12.4	1	4	26
Springfield, Mass	38	13.3	15.2	4	4	63
Syracuse	73	19.2	16.7	11	7	134
Tacoma	26	12.3	13.1	3	2	77
Toledo	72	12.0	13.3	5	8	48
Trenton	30	11.3	18.7	7	4	119
Washington, D. C	154	14.6	13.6	6	10	84
White	98		12.3	3	7	25
Colored	56	(4)	17.6	3	3	55
Waterbury	27			0	2	0
Wilmington, Del	28	11.4	18.6	2	4	53
Worcester	76	20.1	12.0	4	3	49
Yonkers	31	13.4	9.2	2	3	46
Youngstown	47	14.1	14.2	6	5	80

[3] Deaths for week ended Friday, Apr. 20, 1928.

[4] In the cities for which deaths are shown by color the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended April 30, 1927, and April 28, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 30, 1927, and April 28, 1928.

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928
New England States:								
Maine	2	1	7		86	31	0	0
New Hampshire		1				30		0
Vermont	1				122	32	0	0
Massachusetts	75	92	14	29	408	1,397	2	3
Rhode Island	3	8			2	361	1	0
Connecticut	26	29	3	17	50	354	0	3
Middle Atlantic States:								
New York	423	289	[1] 45	[1] 155	869	3,045	7	49
New Jersey	110	107	22	28	76	1,499	2	3
Pennsylvania	172	169			744	2,024	1	4
East North Central States:								
Ohio		145		114		702		11
Indiana	34	15	33	114	281	650	0	6
Illinois	99	109	58	227	1,459	173	12	13
Michigan	81	60		21	211	1,126	0	6
Wisconsin	34	18	43	780	847	49	9	4
West North Central States:								
Minnesota	13	27	5	9	140	105	7	0
Iowa		5				18		0
Missouri	51	19	1	29	205	527	3	7
North Dakota	2	11		132	73	26	0	1
South Dakota			9	13	219	11	1	0
Nebraska	9	7	8	15	406	128	0	0
Kansas	9	7	12	4	1,027	167	2	1
South Atlantic States:								
Delaware	2				8	35	0	0
Maryland [2]	29	30	34	38	23	728	0	0
District of Columbia	16	17	2	3	6	168	0	0
West Virginia	12	19	105	12	169	207	0	2
North Carolina	11	19			1,681	1,384	0	0
South Carolina	12	13	1,222	543	173	401	0	0
Georgia	8	6	140	102	106	150	1	1
Florida	14	7	7	1		94	1	0
East South Central States:								
Kentucky		9		28		319		0
Tennessee	8	17	112	339	121	784	1	2
Alabama	23	11	87	181	317	426	1	0
Mississippi	5	9						1
West South Central States:								
Arkansas	7	2	59	351	195	393	0	1
Louisiana	26	13	27	45	80	355	0	1
Oklahoma [3]	13	21	67	730	421	447	0	1
Texas	11	15	17	59	275	108	0	0
Mountain States:								
Montana	1	2			40	4	2	0
Idaho	1				48		2	1
Wyoming	2	1			75	14	0	0
Colorado	23	13		1	118	96	1	5
New Mexico	2	8	1	3	117	64	0	0

[1] New York City only. [2] Week ended Friday. [3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 30, 1927, and April 28, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928
Mountain States—Continued.								
Arizona	7	7	-------	1	27	8	0	2
Utah [2]	6	6	2	7	63	-------	0	1
Pacific States:								
Washington	14	8	-------	1	459	165	3	1
Oregon	13	5	35	16	370	90	0	2
California	118	88	23	27	2,378	111	7	5

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928	Week ended Apr. 30, 1927	Week ended Apr. 28, 1928
New England States:								
Maine	0	0	29	24	0	0	4	1
New Hampshire	-------	0	-------	9	-------	0	-------	0
Vermont	0	0	12	10	0	0	1	6
Massachusetts	2	0	435	240	0	0	5	4
Rhode Island	0	0	12	38	0	0	1	0
Connecticut	1	0	99	77	0	0	1	0
Middle Atlantic States:								
New York	4	0	944	722	3	2	18	6
New Jersey	0	0	277	253	0	6	6	5
Pennsylvania	1	2	466	439	0	2	42	6
East North Central States:								
Ohio	-------	1	-------	219	-------	25	-------	6
Indiana	0	0	196	70	166	111	1	2
Illinois	3	0	255	314	18	37	8	12
Michigan	0	0	253	301	34	27	11	4
Wisconsin	1	0	127	122	7	9	1	2
West North Central States:								
Minnesota	0	1	176	120	8	2	2	1
Iowa	-------	0	-------	78	-------	51	-------	2
Missouri	0	0	95	108	18	44	3	1
North Dakota	0	0	69	39	12	3	2	1
South Dakota	0	1	57	25	7	11	0	0
Nebraska	0	0	60	63	31	52	1	0
Kansas	0	0	83	159	5	104	0	3
South Atlantic States:								
Delaware	0	0	19	0	0	0	0	0
Maryland [2]	0	1	67	100	0	0	11	5
District of Columbia	0	0	29	51	0	1	0	0
West Virginia	0	0	43	27	48	40	1	9
North Carolina	0	1	19	16	47	103	5	1
South Carolina	1	1	3	12	14	5	15	7
Georgia	0	0	13	14	24	0	8	4
Florida	3	0	7	4	32	12	25	4
East South Central States:								
Kentucky	-------	0	-------	38	-------	24	-------	5
Tennessee	0	1	31	35	11	48	11	4
Alabama	0	0	9	11	34	5	12	2
Mississippi	0	0	10	11	4	0	2	10
West South Central States:								
Arkansas	0	0	3	12	8	15	16	4
Louisiana	2	0	7	10	12	20	17	9
Oklahoma [3]	1	0	53	49	41	94	11	8
Texas	0	0	14	53	47	43	12	5
Mountain States:								
Montana	0	1	61	8	8	30	3	0
Idaho	0	0	11	9	15	7	0	0
Wyoming	0	0	17	20	1	1	0	1
Colorado	0	1	145	65	4	2	2	0
New Mexico	0	0	11	29	0	3	0	1
Arizona	0	0	4	2	0	6	2	1
Utah [2]	0	1	29	10	0	11	0	0
Pacific States:								
Washington	0	2	60	38	21	35	4	0
Oregon	1	0	32	2	19	63	2	10
California	0	6	186	122	34	19	9	3

[2] Week ended Friday.

[3] Exclusive of Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March, 1928										
Arkansas	10	18	2,168	105	1,986	74	1	81	27	22
Florida	1	56	36	13	227	5	1	35	40	33
Illinois	63	643	854	7	896		6	1,669	282	42
Indiana	2	132	184		1,038		1	720	710	11
Iowa	4	56			173		0	343	257	4
Louisiana	4	96	513	34	1,202	17	0	63	122	30
Michigan	0	281	17	1	5,813		2	1,229	161	19
Mississippi	2	77	11,095	2,833	8,536	549	7	64	31	51
Missouri	40	246	558	1	1,349	2	5	628	296	10
New York	103	1,583		5	10,394		17	3,912	37	79
Ohio	20	577	258		4,598		10	1,289	187	35
Pennsylvania	35	954			6,670	1	5	2,620	2	53
Rhode Island	0	44	10		481		1	225	0	1
Tennessee	5	85	1,207	41	2,158	18	3	171	148	31
West Virginia	6	112	180		628		3	241	391	33
Wyoming	6	1	5		254		1	83	32	1

March, 1928	Cases
Actinomycosis:	
Illinois	1
Anthrax:	
Illinois	1
New York	4
Pennsylvania	8
Chicken pox:	
Arkansas	137
Florida	425
Illinois	1,738
Indiana	425
Iowa	244
Louisiana	79
Michigan	663
Mississippi	894
Missouri	439
New York	2,732
Ohio	1,530
Pennsylvania	2,888
Rhode Island	34
Tennessee	206
Virginia	303
Wyoming	60
Conjunctivitis:	
Missouri	19
Dengue:	
Mississippi	14
Dysentery:	
Florida	5
Illinois	17
Iowa	2
Mississippi—	
Amebic	58
Bacillary	249
Missouri (amebic)	3
New York	8
Tennessee	8
German measles:	
Illinois	126
Iowa	7

German measles—Continued	Cases
New York	1,594
Ohio	66
Pennsylvania	505
Rhode Island	3
Hookworm disease:	
Arkansas	7
Florida	38
Louisiana	7
Missouri	263
Lead poisoning:	
Illinois	13
Ohio	13
Leprosy:	
Florida	2
Louisiana	1
Lethargic encephalitis:	
Illinois	11
Iowa	2
Louisiana	1
Michigan	1
Missouri	1
New York	17
Ohio	3
Pennsylvania	9
Tennessee	3
Mumps:	
Arkansas	195
Florida	66
Illinois	1,743
Indiana	713
Iowa	395
Louisiana	24
Michigan	2,398
Mississippi	1,507
Missouri	1,188
New York	3,464
Ohio	2,322
Pennsylvania	4,611
Rhode Island	185
Tennessee	396
Wyoming	48

	Cases
Ophthalmia neonatorum:	
Arkansas	2
Illinois	49
Mississippi	26
New York	9
Ohio	82
Pennsylvania	12
Tennessee	4
Paratyphoid fever:	
Arkansas	1
Florida	1
Puerperal septicemia:	
Illinois	20
Mississippi	34
New York	18
Ohio	4
Pennsylvania	11
Rabies in animals:	
Mississippi	10
Missouri	3
New York	22
Rhode Island	10
Rabies in man:	
Illinois	1
Ohio	1
Tennessee	2
Scabies:	
Iowa	7
Wyoming	14
Septic sore throat:	
Illinois	32
Michigan	41
Missouri	26
New York	56
Ohio	93
Tennessee	13
Tetanus:	
Florida	1
Illinois	1
Louisiana	2
Missouri	2
New York	1

	Cases
Trachoma:	
Arkansas	98
Illinois	15
Mississippi	14
Missouri	4
New York	4
Ohio	6
Tennessee	14
Trichinosis:	
Illinois	1
Tularaemia:	
Louisiana	1
Ohio	1
Tennessee	1
Typhus fever:	
New York	1
Undulant (Malta) fever:	
Iowa	1
Ohio	1
Vincent's angina:	
Illinois	1
Iowa	1
New York	89
Whooping cough:	
Arkansas	107
Florida	43
Illinois	1,131
Indiana	169
Iowa	33
Louisiana	31
Michigan	651
Mississippi	1,579
Missouri	404
New York	2,024
Ohio	728
Pennsylvania	1,307
Rhode Island	23
Tennessee	125
Virginia	75
Wyoming	25

RECIPROCAL NOTIFICATIONS

Notifications regarding communicable diseases sent during the month of March, 1928, by departments of health of certain States to other State health departments

Referred by—	Diphtheria	Amebic dysentery	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever
California				2	1	
Illinois				3		
Minnesota		[1] 66		1	18	
New Mexico			1			
New York	2		3			1
Ohio						1

[1] 61 of these cases are delayed reports for year 1927.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 100 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregated population of more than 31,400,000. The estimated population of the 94 cities reporting deaths is more than 30,700,000. The estimated

expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended April 14, 1928, and April 16, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	1,440	1,724	
100 cities	867	1,037	883
Measles.			
42 States	17,668	15,173	
100 cities	8,112	4,547	
Poliomyelitis:			
43 States	21	13	
Scarlet fever:			
43 States	4,191	5,185	
100 cities	1,365	2,296	1,324
Smallpox:			
43 States	1,060	881	
100 cities	123	143	133
Typhoid fever.			
43 States	161	278	
100 cities	33	47	48
Deaths reported			
Influenza and pneumonia:			
94 cities	1,390	999	
Smallpox:			
94 cities	0	0	

City reports for week ended April 14, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	6	1	1	0	0	0	14	4
New Hampshire.									
Concord	[1] 22,546	0	1	0	0	0	0	0	2
Manchester	84,000	0	2	0	0	1	6	0	4
Vermont:									
Barre	[1] 10,008	5	0	0	0	0	0	0	0
Burlington	[1] 24,089	0	0	1	0	0	5	0	0
Massachusetts:									
Boston	787,000	14	35	29	3	0	332	11	32
Fall River	131,000	2	3	3	0	0	0	2	4
Springfield	145,000	9	3	9	2	1	4	41	2
Worcester	193,000	15	4	5	4	1	54	40	6
Rhode Island:									
Pawtucket	71,000	3	1	1	0	0	6	12	2
Providence	275,000	0	8	13	0	1	215	7	8

[1] Estimated, July 1, 1925.

City reports for week ended April 14, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND—Con.									
Connecticut:									
Bridgeport	[2]	2	5	9	0	0	2	0	3
Hartford	164,000	7	6	2	1	0	26	8	8
New Haven	182,000	7	3	1	1	1	112	61	6
MIDDLE ATLANTIC									
New York:									
Buffalo	544,600	0	9	26		0	112	24	0
New York	5,924,000	138	248	301	117	31	1,634	24	318
Rochester	321,000	3	9	5	1	1	54	17	10
Syracuse	185,000	15	5	2		0	160	13	6
New Jersey:									
Camden	131,000	3	5	3	0	0	65	3	4
Newark	459,000	27	11	26	7	0	427	12	20
Trenton	134,000	2	3	4	1	3	8	0	5
Pennsylvania:									
Philadelphia	2,008,000	59	70	52	2	12	967	76	98
Pittsburgh	637,000	22	17	10	0	8	136	65	33
Reading	114,000	13	2		0	0	7	0	4
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	5	8	10	2	4	74	3	24
Cleveland	960,000	30	25	43	13	3	49	156	23
Columbus	285,000	4	3	0	5	5	74	4	5
Toledo	295,000	26	3	3	6	4	266	19	5
Indiana:									
Fort Wayne	99,900	2	2	8	0	1	1	0	3
Indianapolis	367,000	29	5	5	0	1	88	151	24
South Bend	81,700	0	1	3	0	0	0	0	0
Terre Haute	71,900	5	1	0	0	0	0	0	3
Illinois:									
Chicago	3,048,000	76	72	81	37	14	30	44	105
Springfield	64,700	11	1	0	1	1	1	9	2
Michigan:									
Detroit	1,290,000	39	49	27	5	6	1,084	35	70
Flint	136,000	12	3	1	0	0	90	80	14
Grand Rapids	156,000	5	4	0	0	1	25	13	1
Wisconsin:									
Kenosha	52,700	32	0	0	0	0	2	0	0
Milwaukee	517,000	94	13	4	8	5	6	22	23
Racine	69,400	5	2	1	0	0	1	4	2
Superior	[1] 39,671	0	0	0	0	0	0	0	5
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	4	0	0	40	2	1	4	2
Minneapolis	434,000	83	14	7	0	6	88	206	29
St. Paul	248,000	28	12	4	0	0	2	67	11
Iowa:									
Davenport	[1] 52,469	6	0	1	0		0	1	
Des Moines	146,000	0	2	1	0		0	0	
Sioux City	78,000	8	1	0	0		4	39	
Waterloo	36,900	11	0	0	0		2	7	
Missouri:									
Kansas City	375,000	17	5	1	0	3	53	108	19
St. Joseph	78,400	3	1	0	0	0	0	9	7
St. Louis	830,000	21	39	38	0	0	290	13	
North Dakota:									
Fargo	[1] 26,403	0	0	0	0	1	0	1	0
Grand Forks	[1] 14,811	0	0	0	0		0	1	
South Dakota:									
Aberdeen	[1] 15,036	10	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	11	1	0	0	0	0	36	0
Omaha	216,000	6	2	1	0	0	1	0	12
Kansas:									
Topeka	56,500	23	1	0	0	0	0	3	5
Wichita	92,500	21	1	1	0	0	1	0	1

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended April 14, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	1	2	2	0	0	3	7	4
Maryland:									
Baltimore	808,000	71	27	25	13	6	818	22	48
Cumberland	[1] 33,741	4	0	1	0	0	2	0	2
Frederick	[1] 12,035	0	1	0	0	0	6	0	3
District of Columbia:									
Washington	528,000	11	11	14	4	4	157	0	12
Virginia:									
Lynchburg	30,500	1	0	0	0	0	12	1	1
Norfolk	174,000	15	1	0	0	0	68	1	6
Richmond	189,000	5	2	2	0	1	0	1	6
Roanoke	61,900	5	0	0	0	2	9	0	0
West Virginia:									
Charleston	50,700	2	0	0	0	1	0	0	1
Wheeling	[1] 56,208	2	1	0	0	0	6	0	1
North Carolina:									
Raleigh	[1] 30,371	1	0	1	0	0	44	0	3
Wilmington	37,700	3	1	0	0	0	8	1	2
Winston-Salem	71,800	8	1	0	0	0	33	15	5
South Carolina:									
Charleston	74,100	0	0	0	8	0	0	0	2
Columbia	41,800	7	0	0	0	0	4	31	2
Greenville	[1] 27,311	0	0	0	0	0	2	4	2
Georgia:									
Atlanta	(2)	15	2	2	9	2	12	8	13
Brunswick	[1] 16,809	0	0	0	0	0	18	4	1
Savannah	94,900	3	0	0	6	1	3	0	5
Florida:									
Miami	[1] 69,754	11	3	2	0	0	1	6	0
St. Petersburg	[1] 26,847	----	0	----	----	0	----	----	2
Tampa	102,000	6	0	0	0	0	1	1	0
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	0	1	0	0	0	14	0	6
Louisville	311,000	1	4	2	5	0	108	10	12
Tennessee:									
Memphis	177,000	12	3	2	0	6	34	13	5
Nashville	137,000	4	0	2	0	6	18	0	4
Alabama:									
Birmingham	211,000	6	1	0	13	3	37	5	6
Mobile	66,800	0	1	1	0	1	0	0	2
Montgomery	47,000	7	0	1	0	----	13	1	----
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	1	0	0	0	----	0	0	----
Little Rock	75,900	0	0	0	3	1	15	1	4
Louisiana:									
New Orleans	419,000	2	7	24	12	7	0	0	14
Shreveport	59,500	2	0	1	0	0	48	0	6
Oklahoma:									
Oklahoma City	(2)	3	1	2	34	0	22	0	5
Tulsa	133,000	26	1	0	0	----	4	12	----
Texas:									
Dallas	203,000	21	4	7	8	3	5	0	12
Fort Worth	159,000	11	2	1	0	0	8	3	8
Galveston	49,100	0	0	1	0	0	3	0	2
Houston	[1] 164,954	0	2	2	0	0	32	0	13
San Antonio	205,000	2	1	5	0	11	4	0	7
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	2	0	0	0	0	0
Great Falls	[1] 29,883	6	0	1	0	0	2	0	1
Helena	[1] 12,037	0	0	0	0	0	0	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	1

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended April 14, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MOUNTAIN—continued									
Idaho:									
Boise	[1] 23,042	2	1	0	0	0	0	0	0
Colorado:									
Denver	285,000	29	10	9	--------	5	69	77	15
Pueblo	43,900	8	1	0	0	0	9	0	4
New Mexico:									
Albuquerque	[1] 21,000	3	0	0	0	0	7	0	0
Utah:									
Salt Lake City	133,000	35	3	3	0	1	3	0	0
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	1	0	0
PACIFIC									
Washington:									
Seattle	(2)	16	5	0	0	--------	133	5	--------
Spokane	109,000	6	2	0	0	--------	0	0	--------
Tacoma	106,000	6	1	0	0	0	27	57	2
Oregon:									
Portland	[1] 282,383	30	7	5	0	0	16	3	9
California:									
Los Angeles	(2)	141	42	19	32	3	24	72	18
Sacramento	73,400	2	2	1	0	0	1	7	4
San Francisco	567,000	40	20	9	4	1	26	32	2

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	3	2	0	0	0	1	1	0	0	6	24
New Hampshire:											
Concord	1	0	0	0	0	2	0	0	0	0	11
Manchester	4	3	0	0	0	0	0	0	0	0	26
Vermont:											
Barre	0	0	0	0	0	0	0	0	0	0	1
Burlington	0	0	0	0	0	0	0	0	0	0	8
Massachusetts:											
Boston	72	71	0	0	0	12	1	0	0	56	245
Fall River	4	0	0	0	0	4	1	1	0	0	32
Springfield	6	19	0	0	0	1	0	0	0	10	35
Worcester	10	7	0	0	0	2	1	0	0	12	72
Rhode Island:											
Pawtucket	1	1	0	0	0	2	0	0	0	0	25
Providence	9	25	0	0	0	6	0	2	0	2	92
Connecticut:											
Bridgeport	12	3	0	0	0	1	0	0	0	9	34
Hartford	5	3	0	0	0	2	0	1	0	2	39
New Haven	11	0	0	0	0	1	0	0	0	24	25
MIDDLE ATLANTIC											
New York:											
Buffalo	23	1	0	0	0	14	1	0	0	12	172
New York	275	386	1	0	0	116	9	10	1	145	1,763
Rochester	15	6	0	0	0	3	0	0	0	3	95
Syracuse	12	10	0	0	0	0	0	0	0	24	54
New Jersey:											
Camden	6	3	0	0	0	2	0	0	0	0	47
Newark	30	36	0	0	0	6	1	1	1	19	139
Trenton	3	1	0	0	0	1	0	0	0	0	59
Pennsylvania:											
Philadelphia	95	83	0	0	0	46	3	0	0	60	659
Pittsburgh	29	18	1	0	0	11	1	0	0	10	206
Reading	3	16	0	0	0	0	0	0	0	6	39

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended April 14, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	20	18	1	1	0	8	1	0	0	7	170
Cleveland	37	16	0	0	0	17	1	0	0	49	212
Columbus	9	10	2	0	0	8	0	0	0	2	83
Toledo	14	7	2	0	0	1	0	0	1	14	55
Indiana:											
Fort Wayne	6	3	3	0	0	0	0	0	0	2	22
Indianapolis	9	11	8	8	0	7	0	0	0	0	118
South Bend	4	0	0	1	0	0	0	0	0	0	12
Terre Haute	2	0	1	3	0	1	0	0	0	0	20
Illinois:											
Chicago	119	74	2	0	0	65	2	0	0	116	784
Springfield	2	9	0	9	0	0	0	0	0	0	29
Michigan:											
Detroit	92	99	2	2	0	27	1	1	2	65	358
Flint	7	9	1	12	0	0	0	0	0	2	36
Grand Rapids	7	4	1	0	0	1	0	0	0	1	43
Wisconsin:											
Kenosha	3	1	1	0	0	0	0	0	0	0	6
Milwaukee	27	40	2	0	0	8	0	1	0	4	148
Racine	4	2	1	0	0	1	0	0	0	4	14
Superior	3	0	1	0	0	1	0	0	0	0	12
WEST NORTH CENTRAL											
Minnesota:											
Duluth	7	8	1	0	0	0	0	0	0	5	24
Minneapolis	49	31	5	0	0	0	0	0	0	15	138
St. Paul	29	6	4	1	0	3	0	0	0	32	47
Iowa:											
Davenport	0	13	3	0			0	0		0	
Des Moines	6	12	2	9			0	0		0	
Sioux City	2	2	2	1			0	0		0	
Waterloo	1	8	0	0			0	0		3	
Missouri:											
Kansas City	13	37	3	4	0	11	0	0	1	8	99
St. Joseph	3	2	1	2	0	1	0	0	0	0	25
St. Louis	39	36	4	3	0	20	2	2	0	11	235
North Dakota:											
Fargo	2	1	1	0	0	0	1	2	0	10	2
Grand Forks	0	3	0	0			0	0		0	
South Dakota:											
Aberdeen	2	2	0	0			0	0		2	
Nebraska:											
Lincoln	3	4	0	0	0	0	0	0	0	1	22
Omaha	3	5	8	4	0	1	0	0	1	0	51
Kansas:											
Topeka	3	5	0	3	0	0	0	0	0	3	21
Wichita	2	1	1	7	0	1	0	0	0	10	15
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	0	0	0	0	0	0	0	0	0	31
Maryland:											
Baltimore	36	34	0	0	0	22	2	0	0	35	284
Cumberland	0	0	0	0	0	0	0	0	0	0	14
Frederick	1	1	0	0	0	0	0	0	0	0	5
District of Columbia:											
Washington	23	27	1	1	0	12	1	0	0	7	141
Virginia:											
Lynchburg	0	0	0	0	0	0	0	0	0	6	7
Norfolk	1	4	0	0	0	2	1	0	0	4	
Richmond	3	3	0	0	0	6	0	0	0	2	48
Roanoke	2	4	1	0	0	0	0	0	0	1	19
West Virginia:											
Charleston	0	1	1	1	0	1	0	0	0	0	16
Wheeling	3	0	0	1	0	1	0	0	0	0	19
North Carolina:											
Raleigh	1	0	0	2	0	1	0	0	0	8	14
Wilmington	0	0	0	0	0	1	0	0	0	1	9
Winston-Salem	0	0	5	0	0	1	0	0	0	0	25

City reports for week ended April 14, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
SOUTH ATLANTIC—continued											
South Carolina:											
Charleston	0	0	0	0	0	1	0	0	0	0	12
Columbia	0	2	0	0	0	1	1	0	0	0	11
Greenville	0	0	1	0	0	1	0	0	0	0	12
Georgia:											
Atlanta	4	11	5	0	0	9	0	0	0	0	83
Brunswick	0	0	0	0	0	1	0	0	0	1	5
Savannah	0	0	1	1	0	3	0	0	0	0	33
Florida:											
Miami	0	1	1	0	0	2	1	3	1	3	27
St. Petersburg	1	------	0	------	0	2	0	------	0	------	10
Tampa	0	1	0	0	0	0	0	2	0	0	------
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	3	1	1	0	0	0	0	0	0	28
Louisville	7	41	0	3	0	7	1	1	1	5	85
Tennessee:											
Memphis	5	2	4	0	0	11	1	0	0	4	74
Nashville	2	1	1	3	0	2	1	2	0	0	55
Alabama:											
Birmingham	2	0	8	0	0	5	1	0	0	8	62
Mobile	0	0	1	0	0	0	1	1	0	0	27
Montgomery	0	0	0	0	------	------	0	0	------	0	------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0	------	------	0	0	------	5	------
Little Rock	1	9	0	0	0	1	1	0	0	0	------
Louisiana:											
New Orleans	5	6	1	0	0	17	2	3	1	6	138
Shreveport	0	1	1	0	0	0	0	0	0	3	31
Oklahoma:											
Oklahoma City	2	4	3	12	0	1	1	0	0	0	34
Tulsa	1	10	1	3	------	------	0	0	------	4	------
Texas:											
Dallas	2	12	2	3	0	2	0	0	0	14	52
Fort Worth	1	6	3	8	0	0	0	0	0	0	45
Galveston	0	0	0	0	0	0	0	2	2	0	13
Houston	1	1	1	1	0	3	0	0	1	0	67
San Antonio	1	3	0	0	0	4	0	0	0	0	75
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	0	0	6	7
Great Falls	1	0	0	3	0	0	0	0	0	5	9
Helena	0	0	0	2	0	0	0	0	0	0	2
Missoula	1	1	1	0	0	0	0	0	0	0	6
Idaho:											
Boise	1	0	0	0	0	0	0	0	0	0	8
Colorado:											
Denver	11	22	2	0	0	8	1	0	0	24	96
Pueblo	2	2	0	1	0	0	1	0	0	0	12
New Mexico:											
Albuquerque	0	0	0	0	0	2	0	0	0	0	12
Utah:											
Salt Lake City	2	2	1	11	0	0	0	0	0	7	24
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	8	5	3	0	------	------	1	0	------	2	------
Spokane	6	6	5	24	------	------	0	0	------	0	------
Tacoma	2	2	5	1	0	0	0	0	0	2	28
Oregon:											
Portland	8	1	6	32	0	3	1	0	0	0	77
California:											
Los Angeles	22	21	4	2	0	30	1	0	0	30	------
Sacramento	1	0	0	0	0	7	0	0	0	1	25
San Francisco	16	14	3	2	0	14	1	1	0	10	186

City reports for week ended April 14, 1928—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Worcester	0	0	0	0	0	0	0	0	1
Connecticut:									
Bridgeport	0	1	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	34	13	2	2	0	0	0	1	1
New Jersey:									
Newark	1	1	2	0	0	0	0	1	0
Pennsylvania:									
Philadelphia	0	0	0	0	0	0	0	1	1
Pittsburgh	1	2	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	4	0	0	0	0	0	0	0	0
Columbus	1	1	0	0	0	0	0	0	0
Toledo	1	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	0	3	0	0	0	0	0	0	0
Illinois:									
Chicago	9	2	1	0	0	0	0	1	0
Michigan:									
Detroit	6	4	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee	6	3	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
St. Paul	1	0	0	0	0	0	0	0	0
Missouri:									
Kansas City	1	2	0	0	0	0	0	0	0
St. Louis	3	0	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	0	0	0	0	0	1	0
SOUTH ATLANTIC [1]									
Maryland:									
Baltimore	1	0	2	2	0	0	0	0	0
District of Columbia:									
Washington	1	0	0	0	0	0	0	0	0
Virginia:									
Richmond	2	0	0	0	0	0	0	0	0
South Carolina:									
Charleston	0	0	0	1	1	0	0	0	0
Greenville	0	0	0	0	0	1	0	0	0
Georgia:									
Brunswick	0	0	0	0	1	0	0	0	0
Savannah	0	0	0	0	1	0	0	1	0
EAST SOUTH CENTRAL									
Tennessee:									
Nashville	0	0	0	0	1	0	0	0	0
Alabama:									
Birmingham	1	1	0	0	0	0	0	0	0
Mobile	0	0	0	0	0	1	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	2	0	0	0
Louisiana:									
New Orleans	0	0	0	0	4	2	0	0	0

[1] Typhus fever, 2 cases at Tampa, Fla.

City reports for week ended April 14, 1928—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
WEST SOUTH CENTRAL—continued									
Oklahoma:									
Oklahoma City	0	0	0	1	0	1	0	0	0
Texas:									
Fort Worth	0	0	0	0	0	1	0	0	0
Houston	1	0	0	0	0	0	0	0	0
MOUNTAIN									
Colorado									
Denver	2	3	0	1	0	0	0	0	0
Nevada:									
Reno	1	0	0	0	0	0	0	0	0
PACIFIC									
Washington									
Spokane	1	0	0	0	0	0	0	0	0
Tacoma	0	0	0	0	0	0	0	1	1
California:									
Los Angeles	0	1	0	0	1	1	0	0	0
San Francisco	1	0	0	0	1	0	0	1	1

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended April 14, 1928, compared with those for a like period ended April 16, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, March 11 to April 14, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928
101 cities	176	158	178	158	190	139	200	132	174	[2] 144
New England	137	136	130	124	137	110	181	120	105	168
Middle Atlantic	240	212	226	222	263	181	209	188	271	209
East North Central	157	135	178	148	159	146	160	121	135	110
West North Central	127	115	121	132	158	84	170	101	109	[2] 103
South Atlantic	141	139	146	112	157	121	117	88	141	82
East South Central	30	105	41	60	61	85	66	25	86	40
West South Central	161	136	174	116	178	108	335	132	141	160
Mountain	126	106	81	80	108	115	170	44	108	133
Pacific	165	125	193	105	170	74	125	77	115	74

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] St. Paul, Minn., not included.

Summary of weekly reports from cities, March 11 to April 14, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

MEASLES CASE RATES

	Week ended—									
	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928
101 cities	929	1,349	943	1,326	837	1,388	867	1,277	766	[1] 1,351
New England	212	2,277	198	1,536	205	2,014	270	1,874	223	1,726
Middle Atlantic	93	1,213	114	1,393	127	1,491	159	1,504	172	1,739
East North Central	1,233	1,063	1,138	1,009	925	1,023	957	1,034	885	998
West North Central	1,560	590	1,514	725	1,821	748	1,300	762	1,314	[1] 946
South Atlantic	1,010	2,972	972	2,893	1,091	2,905	936	2,285	1,311	2,115
East South Central	441	1,855	436	1,426	284	1,696	608	958	396	1,117
West South Central	1,026	1,328	1,754	1,120	935	836	2,114	436	1,905	428
Mountain	5,397	345	5,074	504	3,443	752	2,788	708	2,080	743
Pacific	2,923	830	3,163	807	2,761	580	3,051	447	2,207	524

SCARLET FEVER CASE RATES

	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928
101 cities	431	300	423	309	440	303	394	273	391	[1] 227
New England	546	402	479	411	530	405	367	331	423	301
Middle Atlantic	572	352	580	374	612	398	504	366	581	273
East North Central	353	296	347	306	329	266	272	252	285	194
West North Central	426	271	400	292	467	257	433	263	396	[1] 292
South Atlantic	220	223	179	224	197	221	177	179	150	154
East South Central	208	160	162	234	172	204	177	100	218	234
West South Central	62	208	56	124	54	144	99	148	59	128
Mountain	1,336	248	1,130	177	1,210	186	941	239	950	239
Pacific	253	217	360	202	340	207	243	133	243	123

SMALLPOX CASE RATES

	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928
101 cities	31	21	30	25	28	25	26	18	24	[1] 20
New England	0	0	0	0	2	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	33	26	29	18	33	24	37	24	32	24
West North Central	49	64	69	125	30	64	42	84	55	[1] 52
South Atlantic	51	33	41	23	61	68	25	14	27	11
East South Central	132	20	106	25	122	30	86	10	96	35
West South Central	45	44	74	36	62	36	103	4	87	16
Mountain	90	53	18	62	9	142	27	106	27	150
Pacific	84	38	99	61	68	23	55	18	26	74

TYPHOID FEVER CASE RATES

	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928
101 cities	7	4	8	4	8	5	8	4	8	[1] 5
New England	5	7	5	9	12	5	7	2	9	[1] 9
Middle Atlantic	6	2	7	4	6	4	6	1	5	5
East North Central	4	3	4	3	1	2	5	3	1	1
West North Central	0	4	4	0	2	2	2	6	12	[1] 9
South Atlantic	11	11	13	11	16	21	9	12	13	4
East South Central	21	10	41	5	20	10	35	15	35	20
West South Central	12	12	29	8	25	12	37	16	17	20
Mountain	9	0	0	0	0	0	0	0	9	0
Pacific	18	5	10	5	24	3	8	8	18	3

[1] St. Paul, Minn., not included.

Summary of weekly reports from cities, March 11 to April 14, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]—Continued

INFLUENZA DEATH RATES

	Week ended—									
	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928
95 cities	31	25	27	32	22	29	23	34	21	[2] 30
New England	19	7	7	9	12	11	7	16	16	9
Middle Atlantic	31	26	26	22	21	29	26	31	21	27
East North Central	18	12	16	35	15	24	9	40	11	27
West North Central	21	10	14	16	4	18	17	16	12	[2] 26
South Atlantic	79	19	65	39	38	21	40	19	38	30
East South Central	90	84	96	89	106	78	74	73	90	84
West South Central	21	115	25	98	30	86	51	107	42	90
Mountain	18	80	27	133	27	53	36	80	18	53
Pacific	14	10	28	7	24	14	17	7	14	14

PNEUMONIA DEATH RATES

	Mar. 19, 1927	Mar. 17, 1928	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928
95 cities	184	221	167	213	163	222	162	215	153	[2] 207
New England	172	239	156	182	150	225	140	179	156	177
Middle Atlantic	226	258	198	245	186	264	198	244	175	243
East North Central	142	194	141	211	147	207	131	241	141	199
West North Central	114	139	101	118	93	130	137	122	128	[2] 169
South Atlantic	262	214	218	240	225	230	150	179	184	209
East South Central	191	335	107	240	133	288	218	397	138	183
West South Central	195	263	136	275	161	242	140	185	76	238
Mountain	161	203	170	168	161	106	242	97	152	186
Pacific	93	125	110	101	128	118	117	105	117	88

[2] St. Paul, Minn., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31, 050, 300	31, 657, 000	30, 369, 500	30, 960, 700
New England	12	12	2, 242, 700	2, 274, 400	2, 242, 700	2, 274, 400
Middle Atlantic	10	10	10, 594, 700	10, 732, 400	10, 594, 700	10, 732, 400
East North Central	16	16	7, 820, 700	7, 991, 400	7, 820, 700	7, 991, 400
West North Central	12	10	2, 634, 500	2, 683, 500	2, 518, 500	2, 566, 400
South Atlantic	21	21	2, 890, 700	2, 981, 900	2, 890, 700	2, 981, 900
East South Central	7	6	1, 028, 300	1, 048, 300	980, 700	1, 000, 100
West South Central	8	7	1, 200, 700	1, 307, 600	1, 227, 800	1, 274, 100
Mountain	9	9	581, 600	591, 100	581, 600	591, 100
Pacific	6	4	1, 996, 400	2, 046, 400	1, 512, 100	1, 548, 900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended March 31, 1928.—The following report for the week ended March 31, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Suez.
Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Ceylon.—Colombo.
Dutch East Indies.—Surabaya.
Siam.—Bangkok.

CHOLERA

India.—Bassein, Bombay, Calcutta, Madras, Moulmein, Rangoon.
Siam.—Bangkok.
French Indo-China.—Saigon.
China.—Canton, Shanghai.

SMALLPOX

India.—Bombay, Calcutta, Madras, Moulmein, Rangoon, Tuticorin, Vizagapatam.
French India.—Pondicherry.
Dutch East Indies.—Banjermasin, Pontianak.
China.—Canton, Shanghai, Hong Kong.
Japan.—Shimonoseki.
Kenya.—Mombasa.
Egypt.—Suez
Kwantung.—Dairen.
Manchuria.—Mukden.
Sarawak.—Kuching.

Returns for the week ended March 31 were not received from Balikpapan or Sabang, Dutch East Indies, or Basra, Iraq.

CANADA

Provinces—Communicable diseases—Week ended April 7, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended April 7, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec [1]	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever				1				1
Influenza	6			3				9
Smallpox				9		12	13	34
Typhoid fever		2	12	9	1	1		25

[1] 1 case of poliomyelitis and 15 cases of typhoid fever reported from Province of Quebec for week ended Mar. 31, 1928.

Quebec Province—Communicable diseases—Week ended April 14, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended April 14, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	63	Scarlet fever	103
Diphtheria	43	Smallpox	20
German measles	15	Tuberculosis	59
Influenza	5	Typhoid fever	14
Measles	214	Whooping cough	6

Vital statistics—Quebec Province—February, 1928.—Births and deaths in the Province of Quebec for the month of January, 1928, were reported as follows:

Estimated population	2,650,000
Birth rate per 1,000 population	27.4
Death rate per 1,000 population	12.4
Infant mortality rate	126.3
Deaths from—	
Cancer	126
Cerebrospinal meningitis	2
Diphtheria	45
Diabetes	26
Diarrhoea	77
Heart disease	326
Influenza	108
Deaths from—Continued.	
Measles	15
Pneumonia	257
Poliomyelitis	2
Scarlet fever	12
Smallpox	0
Syphilis	4
Tuberculosis (pulmonary)	198
Tuberculosis (all other forms)	55
Typhoid fever	18
Violence	33
Whooping cough	32

The following table gives a comparison of the vital statistics of the Province of Quebec for the month of February of the years 1926, 1927, and 1928:

	February		
	1926	1927	1928
Birth	6,472	6,137	6,051
Marriages	971	1,145	1,025
Deaths	2,812	3,244	2,730
Deaths under 1 year	847	835	764

HAITI

Cape Haitien—Meningococcus meningitis—April 26, 1928.—Under date of April 26, 1928, an epidemic of meningococcus meningitis was reported in the region around Cape Haitien, Haiti.

IRAQ

Leprosy—1922-1927.—During the six years ended December 31, 1927, a total of 210 lepers was registered in the Iraq Health Directorate, of whom 199 were males, suggesting that a number of female lepers were not registered.

Of the registered cases approximately 56 per cent were anesthetic, 37 per cent nodular, and 7 per cent mixed. The places of origin, which are probably the places of infection, were as follows:

Places of origin	Males	Females	Total cases	Places of origin	Males	Females	Total cases
Baghdad Liwa	14	1	15	Kirkuk Liwa	3	0	3
Basra Liwa	20	0	20	Kut Liwa	11	0	11
Mosul Liwa	6	1	7	Muntafiq Liwa	17	1	18
Amarah Liwa	62	6	68	Sulaimani Liwa	2	0	2
Arbil Liwa				Tribal (unclassified)	6	0	6
Diwaniyah Liwa	10	0	10	Kurdistan	6	0	6
Diyalah Liwa	3	0	3	Persia	28	1	29
Dulaim Liwa	4	0	4	Afghanistan, etc	3	1	4
Hillah Liwa	3	0	3				
Kerbalah Liwa	1	0	1	Total	199	11	210

MEXICO

Puerto Mexico—Malaria—October-December, 1927—Campaign against hookworm infection, March, 1928.—Malaria was reported present with more than the usual rate of prevalence at Puerto Mexico, State of Vera Cruz, Mexico, during the period October-December, 1927. In March, 1928, a campaign against hookworm infection was instituted at Puerto Mexico and Minatitlan, with special reference to school children, the local units supplying the remedies necessary when gratuitous treatment was required.

SWITZERLAND

Basel—Vital statistics, 1926.—The population of Basel, Switzerland, in 1926, was estimated at 147,426. The birth rate for that year was 16.4 per 1,000 population; the death rate 11.7 per 1,000; and the infant mortality was 34.4 per 1,000 births. The following table gives the number of cases of the more common communicable diseases, and the deaths from these diseases for the year 1926:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	2		Smallpox	0	0
Chicken pox	364		Tuberculosis (pulmonary)		137
Diphtheria	84		Tuberculosis (miliary)		8
Measles	2,410	8	Tuberculosis (other forms)		35
Mumps	28		Typhoid fever	11	2
Puerperal fever	8	8	Whooping cough	259	2
Scarlet fever	139				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	Apr. 7, 1928
China:																			
Amoy	C	28	72	16															
	D	7	3																
Canton	C	31	36	14	12	1											1	1	
	D	16	25	14	11	1											1	1	
Foochow	C	P	P	P															
Hong Kong	C	P	1	P															
Shanghai (settlement and concession)—																			
Foreigners only	C	1	6	3															
Including natives	D	20	74	7															
Swatow	C	42	P	P	P														
	D		P	P	P														
Tientsin	C	P	15	2	P	1													
Dutch East Indies: Java—Batavia	C				28	3													
	D				18	3													
India	C	45, 163	31, 390	20, 160	23, 047	25, 139	15, 377	3, 267	3, 097	3, 026	3, 001	2, 865	3, 047						
	D	22, 051	15, 895	10, 371	12, 863	15, 026	8, 863	1, 765	1, 739	1, 684	1, 562	1, 529	1, 686						
Bassein	D									1			1	1			4	25	22
Bombay	C	42	3		2				1						1	1			
	D	30	2		2										1	1		1	
Calcutta	C	87	76	101	199	428	176	39	36	70	58		80	99	162	164			
	D	40	39	64	138	281	125	18	24	38	32	35	42	63	101	94	122	114	112
Madras	C	547	59	14	13	1	1	1			1		3	11			7		
	D	278	48	8	7	2	1		3		1	2	2	7	7		2	1	1
Madras Presidency	C	7, 660	3, 056	2, 050	3, 073	3, 702	1, 864	1, 163	1, 301	1, 305	912	930	839						
	D	3, 513	1, 581	1, 055	1, 736	2, 104	984	623	813	726	498	504	457						
Negapatam	C							4											
	D							4	1		1	2	2						
Rangoon	C	1	2	6	2	8	4	4		1	1	10	12	3	4	4			
	D	1	2	5	5	6	3			1	1	8	4	2	4	2	3	6	5
Tuticorin	C			1		8													10
	D			1	37	14										1			8

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928 21	January, 1928 28	February, 1928 4	February, 1928 11	February, 1928 18	February, 1928 25	March, 1928 3	March, 1928 10	March, 1928 17	March, 1928 24	March, 1928 31	Apr. 7, 1928
India (French):																			
Chandernagor	C	1	1		6	10	14	1		5		2	2						
	D	1			6	10	9			1		2	2						
Karikal	C	18	1		1	1	8	9	7	8	8	2	2	2					
	D	12	1		1	1	4	5	4	5	5	2	1	2					
Pondicherry	C	12	15		1	25	11	2	3	2	5	17	10	6					1
	D	11	15		1	21	12	2	3	2	3	12	4	3					1
Indo-China: Saigon	C		1	1			3	1	1		2	1	5	2	8	27	13	21	35
	D						1				1	1	1		6	19	8	12	20
Iraq[1]																			
Philippine Islands: Manila	C	1																	
Siam	C	77	40	18	110	88	110	50	33	48	69	74	59	84	78				
	D	53	24	11	76	64	80	34	21	42	42	50	38	73	53				
Bangkok	C	2	3	5	4	3	21	11	28	28	34	23	17	12	8	8	12	16	24
	D	1	1	3	2	2	11	7	16	26	17	12	11	7	6	5	5	12	11
Straits Settlements: Singapore	C				7	5	23	2			1					1			
	D				5	4	12	1								1			
On vessel:																			
S. S. Adrastus. At Yokohama, Japan	C	1																	
	D	1																	
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C																		P
S. S. Tabaristan. At Basra, Iraq	C			1															

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

Place		July–September, 1927	October, 1927	November, 1927 1–10	November, 1927 11–20	November, 1927 21–30	December, 1927 1–10	December, 1927 11–20	December, 1927 21–31	January, 1928 1–10	January, 1928 11–20	January, 1928 21–31	February, 1928 1–10	February, 1928 11–20	February, 1928 21–29	March, 1928 1–10	March, 1928 11–20
Indo-China (French):																	
Annam	C	3,179	226	13	75	38	16	2		79	95	93	23	36	14	18	18
Cambodia	C	251	180	56	1	28	21	12	39	30	9	15	38	22	51	33	22
Cochin-China	C	469	178	21	27	52	17	38	58	46	119	130	178	113	153	206	217
Laos	C	246	67	10													
Tonkin	C	1,297	1			1			2	1							
Kwangchow-wan	C	16															

PLAGUE

[C indicates cases, D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928 21	January, 1928 28	February, 1928 4	February, 1928 11	February, 1928 18	February, 1928 25	March, 1928 3	March, 1928 10	March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14
Algeria: Oran	C	1		2															
	D	1																	
Arabia: Aden	C					19	13	22	54	89	63	45	77	158	189	148	151	163	
	D					7	8	8	33	55	50	31	26	99	134	135	134	126	
Argentina:																			
Bahia Blanca district	C				3														
Buenos Aires	C									2									
Cordoba Province	C		P	P	10	2													5
Firmat	C				1														
Quilino	C				3														
Rosario	C				4	5		4			1								
Santiago Province	C										1								
Ucacha	C				1														
Azores: St. Michaels Island	C	2	3	3	3	2	3	1	2	2	1	1	1		1				
	D	1	1		1	1	1	1	1	1			1		1				
Brazil:																			
Bahia	C					4	2		2	1	4	4							
	D					4		1	2	1	2	3							
Porto Alegre	C												2						
Rio de Janeiro	C						1		1	2	1	1		1	2				
	D									1	2				2				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928 21	January, 1928 28	February, 1928 4	February, 1928 11	February, 1928 18	February, 1928 25	March, 1928 3	March, 1928 10	March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14
British East Africa:																		
Tanganyiki	C		P	P	P	P			2									
	D								2	2								
Uganda	C	226	99	99	67	79	16											
	D	158	88	96	61	64	12											
Canary Islands: Las Palmas	C		9		3	3	1				1				2		2		
	D				1	1	1				1								
Teneriffe	C						1	3	3	3									
	D						1		3										
Ceylon: Colombo	C	3	1		6	7	1	1	1		3	3	4	1	3		4		
	D	3			6	6	1	1			1	3	1	1	3		2		
China: Tungliao	D		200																
Dutch East Indies:																		
Balik-Papan	C					1													
	D					1													
Celebes—Makassar	C			6	2	6	2	1	1	1		1							
	D			6	2	5	2	1	1	1		1							
Java	D	432	779	829	1,017	751	197	214											
Batavia and West Java	C	68	130	132	154	128	46	37	27	31	15	24							
	D	68	129	132	152	128	44	37	27	31	15	24							
Cheribon	C				1														
	D				1														
East Java and Madura	C	18	17	10	8	7	5	2											
	D	18	17	10	8	7	5	2					P						
Pasoeroean Residency	C				P														
Surabaya Residency	C				P												1		
	D																1		
Surakarta Residency	C			P	P														
Egypt:																		
Alexandria	C	1			12	5			1		1								
	D				7	2			1		1								
Cairo	C					2													
	D					2													
Minieh Province [1]																			
Suez	C	1				1	1		3		3	4	3	3		4	7	3	

Greece:																		
Athens and Piraeus	C	3	1			3												
	D		1			1												
Mitylene	C	5	1	3	3													
Patras	C	2	1	1														
	D		1	1														
Hawaii Territory: Hawaii	D										1							
India	C	2,710	3,246	3,600	5,518	7,097	2,544	2,699	3,601	3,808	5,188	5,776						
	D	1,428	1,792	2,065	3,269	4,925	1,653	1,661	2,577	2,630	3,585	3,999						
Bassein	D	14	8	4	4	17	3	3		2	1	2	4	5	5	5	7	5
Bombay	C	7	4			3	5	4	2	3	5	14	7	7	4			
	D	5	3			3	2	2	3	2	6	14	7	6	4	11	25	21
Calcutta	C	18				2												
	D	10						1										2
Madras Presidency	C	465	583	470	791	550	107	132	79	134	142	112	185					
	D	230	298	282	359	206	63	64	60	69	79	72	100					
Rangoon	C	6	11	11	15	17	8	9	7	11	15	16	6	11				
	D	6	11	11	15	16	7	7	6	10	12	15	6	10	4	9	5	8
Indo-China: Saigon	C	2		1														
Iraq:																		
Baghdad	C						1	1		2		1	1		2		1	
	D						1			1		1	1		2	1	1	
Dulaim Liwa	C								1									
Nigeria: Lagos	C			17	13	10	2	3	3	2	2	3	2	1	2			
	D			17	13	8	3	3	3	2	2	3	2	1	2			
Senegal: [2]																		
Baol	C	72	95	P	P													
	D	33	40															
Cayor	C	463	176	48														
	D	233	88	28														
Dakar	C	20	1															
	D	12																
Louga	C	5	8															
	D	4																
Rufisque	C	16																
	D	12																
Thies and vicinity	C	9	1	1													8	
	D	7															4	
Siam	C		13	1	3	16	5	3	6	6	13	4						
	D		9		2	11	1	1	5	5	10	4						
Bangkok	C		2			1		1	1		1						1	
	D			1		1		1	1		1						1	
Straits Settlements: Singapore	C			1						1	1	1		1		1		
	D			1						1	1	1				1		
Tunisia [3]																		
Turkey: Constantinople	C	1	1		2													
	D		1		1													

[1] 32 cases and 5 deaths from plague in Minieh Province, Egypt, for week ended Apr. 21, 1928.
[2] During January, 1928, 5 cases of plague were reported in interior of Senegal; 17 cases with 13 deaths during last 2 weeks in February; 8 cases and 4 deaths, Mar. 11 to 20, 1928.
[3] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	April, 1928: 7	April, 1928: 14
Union of South Africa:																			
Cape Province	C			2	2		1												
	D			2	1		1												
Orange Free State	C			1	8			2		3	4	1							
U. S. S. R.:	D			1	6			1		3	1								
Chita district	C		1																
	D		1																
Northern Caucasus	C	14	1																
	D	10																	
Venezuela: State of Miranda—Tacata and Cua	C													P					
On vessel:																			
At La Plata, from Rosario, Argentina	C					1													
S. S. Aghios Gerasimos, at Vigo, Spain	C			3															

Place		July–September 1927	October 1927	November 1927	December 1927	January 1928	February 1928	March 1928
Algeria: Algiers	C		2					
British East Africa: Kenya	C	95	18	28	16	26		
Ecuador: Guayaquil	C	15	4	9	5	4	6	
	D			3	2	4	3	
Indo-China (French)	C	14	3	3	4	7		5
Madagascar	C	314	166	209	317	427	342	
	D	286	155	189	261	388	317	
Ambositra Province	C	7	6	1	18	105	67	
	D	7	6	1	10	96	66	
Antsirabe Province	C	39	19	18	72	117	108	
	D	38	19	17	72	117	108	
Itasy Province	C	46	16	26	62	33	19	
	D	41	15	25	54	29	17	
Moramanga Province	C	12	24	46	25	19	25	
	D	12	20	41	22	19	24	

Place		July–September 1927	October 1927	November 1927	December 1927	January 1928	February 1928	March 1928
Madagascar—Continued.								
Tananarive Province	C	211	99	170	139	155	123	
	D	189	93	153	108	129	102	
Mauritius	C	1						
Nigeria	C	32	27	16	20	16		
	D	29	27	16	18	16		
Peru	C	34	14	6	14		41	
	D	19	5	2	4		14	
Callao	D	3			3			
Lima	C				7			
	D		1	1	1			
Syria: Beirut	C				2			

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	28	February, 1928: 4	11	18	25	March, 1928: 3	10	17	24	31	April, 1928: 7	14
Algeria	C	459	382	683	661	170	129	17	18	20	16	30								
Algiers	C					3	9	3	1	7	4	4		5	1		2			
Oran	C	9	16	11	20	39	29	2	2	4	3	1		2	2		2	10		
Arabia: Aden	C				1	3	1					1								
Brazil:																				
Para	C	1																		
Rio de Janeiro	C	6	10		1															
	D	4	9		1											1				
British East Africa: Tanganyiki	D	21	8	P	P	P	8	4		1										
British South Africa:																				
Northern Rhodesia	C	55	39	164	185	252	236	3		230		79	117	38	63					
	D	1	2	11	64	62	31			23		5	32	2	3					
Southern Rhodesia	C				3	2	1			P	3	2	4	P	3					
	D												1							
Canada:																				
Alberta	C	17	17	23	10	19	11	1	19	1	6		3		7	7	20	7	13	
Calgary	C	1														1				
Edmonton	C			1	1	8	5	1			2	1		11	1	1	11	1	7	2
British Columbia: Vancouver	C		2			4	8	11	3	1	11	2	1	3	4	2	5			
Manitoba	C	13	9	7	19	7	11		1											
Winnipeg	C	5	4	2	2	2	2	1	1											
New Brunswick [1]	C						1						1							
Nova Scotia	C		2	1																
Halifax	C		1	1																
Ontario	C	60	22	96	284	347	212	52	77	63	51	40	51	36	20	19	35	20	9	
Hamilton	C					2										2				
Kingston	C				1		1				1									2
Ottawa	C	27	40	67	134	63	60	20	16	23	9	11	3	1	7	6	8	10	2	
Toronto	C		2	10	34	39	28	8	5	1	6	4	4	2	4	2	3	3	1	2
Windsor	C			9																
Quebec	C	1		8	25	16	44	7		11	8	11	13		18	22	40	35	15	20
Montreal	C				1		8	3	4	1		5	1	3		6	3			
Quebec	C					4	5		5				2	5	4	3	4	4	5	1
Riviere du Loup	C				3															
Sherbrooke	C																	3		

[1] The report of 2 cases of smallpox in New Brunswick during the week ended Sept. 24, 1927, which has been published in prior issues of the PUBLIC HEALTH REPORTS, was erroneous. No smallpox was reported in New Brunswick during September, 1927.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928 21	January, 1928 28	February, 1928 4	February, 1928 11	February, 1928 18	February, 1928 25	March, 1928 3	March, 1928 10	March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14
Canada—Continued.																				
Saskatchewan	C	14	68	31	34	58	52	39	15	9	34	7	8		7	14	7		12	
Moose Jaw	C	10	16	3		1	4	4	2	3	2		2	6	5	2	5			3
Regina	C	8		5	1	1												1	2	3
Saskatoon	C					2	4	13	1		1		2							
Ceylon: Colombo	C	1			1	2		1		1	2	2	1	3						
	D	1				1		1									1			
China:																				
Amoy	C														1	1				
Antung	C						1													
Canton	C		1												2	3	2			
	D		1																	
Chefoo	C		1	P		P										P				
	D		1											1						
Foochow	C	P	P	P	P	P	P		P		P		P		P					
Hong Kong	C	1	2				1	1		1		1	3		3	5	7	10	10	
	D	1	2				1		1	1			1	1	2		2	5	12	
Manchuria—																				
Changchun	C					1			4											
Dairen	C			1	2	1	5	1		5	9	3	4	6				4	6	
	D			1					1	2	5	4	2	1						
Fushun	C		1		1															
Harbin	C					2	1		2	1	2	2	1	3	1					
Mukden	C			2	1				1		3	18		3				1		
Pensihu	C			1																
Shanghai—																				
Foreigners only	C							1	2		2	1	1	1	3	1				
Including natives	D							3	2	3	3	5	4	4	6	2	1		3	
Tientsin	C		4	13	8	9	8	20	10	10	8	5	2	2	11	4				
Curaçao (alastrim)	C							2				3								
Dominican Republic: Santo Domingo	C															2				
Dutch East Indies:																				
Borneo—																				
Pontianak	C												1							
Samarinda district	C				P															
South and East Borneo Residency	C	P																		

Java—																				
Batavia and West Java	C	4		4	25					1	3		1							
	D				15															
East Java and Madura	C	4	22	8	9	9	5	2												
	D			1																
Sumatra Medan	C					3	9	3	5	5	10	7	3	1	3					
	D					2	3	4	4		3				2					
Egypt	C		3			4	4				1		1							2
	D		1	1		1														
Cairo	C					2														
Great Britain:																				
England and Wales	C	568	508	473	902	1,041	1,175	405	370	386	369	369	392	365	347	359	342	322		
Birmingham	C	1		1				14	17	11	2	1		2		1				
Bradford	C				11	19	32	6	9	7	2	7	1		4	9		5	5	
Bristol	C			6	4	8			2		1			1	3		2	8		
Cardiff	C				1		1											5		
Leeds	C	5	3	7	5	16	11	1			2	1	2	4	2	3	5	3	3	
Liverpool	C						1								1					
London	C							2		1	5	10	1	2	1	10	5	1		
Manchester	C			3	6	25	5	11	6	4	4	1	4	1	2	4	3	3		
Newcastle on Tyne	C	1	2	6	9	55	22	14	3	4	6	4	1	4	3	3	4		2	
Nottingham	C						13	4	8	6	9	6	1	3	1	5	1	6		
Sheffield	C	2	1	10	6	9	14	4		4		1	2	2	1				1	
Stoke on Trent	C	1					4			1		2	4	3	6	11				
Greece: Saloniki	D	2																		
India	C	5,911	4,398	3,158	4,052	6,731	10.676	4,129	3,631	5,159	4,858	4,567	4,220							
	D	1,668	1,120	715	927	1,650	2,429	964	803	988	954	1,073	938							
Bassein	C	1									1									
	D	1																		
Bombay	C	33	12	10	4	9	14	10	23	10	18	29	23	46	51	49	58	62	49	
	D	19	8	2	3	2		2	8	7	7	15	13	23	22	24	33	36	27	
Calcutta	C	27	22	5	5	25	36	14	11	23	10	9	18	14	30	20	29	45	40	
	D	25		6	2	11	27	10	7	10	7	5	11	10	24	15	21	33	35	
Karachi	C														1	1				
	D														1					
Madras	C	6	7	8	7	11	21	9	16	20	29	15	33	21	31	30	27	45	81	
	D		2		2	3	6	3	2	2	1	3	3	3	10	5	3	6	15	
Negapatam	C	3	1				5		4	2	2	1		1	1					
	D	2	1				3		2	1										
Rangoon	C	14	9	17	6	14	136	41	34	103	97	68	82	132	95	96	82	92	50	
	D	3	2	3	1	4	31	13	10	18	23	22	24	26	32	28	17	34	23	
Vizagapatam	C		3				3	2	1	5	2		1		1			3		
	D		2					6	1		1									
India (French):																				
Karikal	C	3	1	2	P															
	D	3	1	2																
Pondicherry	C	39	37	38	42	41	65	15	17	15				6	3		6	5	7	
	D	31	37	38	42	41	50	15	17	15				6	3		6	5	7	
Indo-China: Saigon	C	1	1			1	3						2		1					

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths; P, present]

Place		July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Dec. 18, 1927-Jan. 14, 1928	Week ended— January, 1928 21	January, 1928 28	February, 1928 4	February, 1928 11	February, 1928 18	February, 1928 25	March, 1928 3	March, 1928 10	March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14
Iraq:																				
Baghdad	C		1	7	5	25	23	7	6	3	3	2		3	2					
	D		1	4	4	14	12	3	5	2	1	1		1	2					
Basra	C	1	4	2	3	4	2	1				1		2	4	4	1			
	D	1	4	2	1	3	1									1	1			
Italy:																				
Leghorn	C													1		1				
Rome and vicinity	C		1				2													
Jamaica (outside Kingston) (alastrim)	C	6	9	9	7	3	2		4	1		1	3		6	3	2			
Kingston	C		3	8																
Japan:																				
Nagasaki	C	2																		
	D	1																		
Tokyo	C							2	1		1		1		3					
	D								1					1	1					
Mauretania	C											P	P							
Mexico:																				
Acapulco	C		2		1															
	D		2		1															
Chihuahua	D						1													
Jalisco (State)	C																		P	
Guadalajara	D					2								1					2	2
Manzanillo	D						1									1				
Mexico City and surrounding territory	C					4				1	1	2								
San Luis Potosi	D	1																		
Tampico	C												1							
Torreon	D	1		2																
Nigeria: Southern Provinces	C													7						
Palestine: Jerusalem	C					1			1											
	D								1											
Poland	C	2				1	6	1	1	1		1								
	D	1																		
Porto Rico	C															P				

Portugal:																				
Lisbon	C		3	8	4	10	12	5	2	2	3	3	9	4	4		2			
	D					1														
Oporto	C		1																	
Senegal: Dakar	C												8		26	17				
	D															12				
Siam	C	51	27	6	1	9	23	13	7	5	10	1	7	1	3			3		
	D	10	15			1	2	1	1	2		1	1		1			2		
Bangkok	C		3		1	1	3													
	D		1				1													
Spain:																				
Malaga	D				1	1														
Seville	C						1													
Valencia	C			1			2								1		1	1		
Straits Settlements: Singapore	C				1					1		1				1				
Switzerland	C						2													
Tunisia: Tunis	C						4		3			2	4	2	6	1				
Union of South Africa:																				
Cape Province	C	P		P				P			P									
Orange Free State	C	P			P	P	P	P			P									
Transvaal	C			P	7															
Upper Volta	C											2	3							
Venezuela: Maracaibo	D		2	1							1				1					
On vessel: S. S. Arendskerk at Singapore from Amoy, China	C																	P		

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927	December, 1927			January, 1928			February, 1928			March, 1928			Apr. 1-10, 1928
							1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	
Algeria	C	376	459	382	682														
Oran	C	14	10	16	11														
Indo-China (French)	C	19	3	21	25	38	10	4	20		40	18	50	31	90	57	71		
Syria:																			
Aleppo	C								1		1								
Beirut	C						1		1			15	11	26		12	7	4	3
Damascus	C		3	5	22	13	4	6	2	11	2						1		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July-September	October	November	December	January	February	March
Angola	C	51	73	71				
	D		2					
Congo	C	5	77					
Cuanza-Norte	C	1						
Cuanza-sul	C		2		7			
Loanda	C	1						
Zaire	C	3	4	1				
Brazil: Porto Alegre	C	11	4	1			1	
British East Africa: Zanzibar	C		2					
	D		1					
Chosen	C	21	2	2		4		
	D	6		1		2		
Ecuador: Guayaquil	C	4	1	1	4	2	9	
France	C	37	7	4	14	11	10	
Gold Coast	C	7	4					
Greece	C	10	4		5	6	11	19
	D						2	2

Place		July-September	October	November	December	January	February	March
Latvia	C		2				1	
Mexico	D	221	132	157				
Morocco	C	180	81	140	401	55	47	
Nigeria	C	820	223	93				
	D	173	51	30				
Persia	D			2		7		
Portugal	C					143		
	D					22		
Spain: Madrid	D			1				
U. S. S. R.:								
Railways, etc	C	26	7	11	15			
Other territories in Europe	C	366	220	471	565			
Transcaucasus, Siberia, and Central Asia	C	80	40	21	20			
Ukraine	C	27	11	20	17			

TYPHUS FEVER

[C, indicates cases; D, death; P, present]

Place		July 31-Aug 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov 19, 1927	Nov 20-Dec 17, 1927	Week ended— December, 1927: 24	December, 1927: 31	January, 1928: 7	January, 1928: 14	January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	Apr. 7, 1928
Algeria:																						
Algiers	C											1					1	2	1	1	2	
	D																1					
Oran	C						1	1	1	1		2			2	1	6	1	1		2	

Austria: Vienna	C												1									
Bulgaria: Sofia	C			17	6	1	1	4	1		1											
	D				1																	
Chile:																						
Antofagasta	D			1																		
Valparaiso	C		1		1	2				1							1					
	D	2	1		2																	
China:																						
Manchuria—Harbin	C	2			1																	
Tientsin	C		2																			
Egypt	C	2		12	4	14	1		3	4	2			1				1		1		
	D	3		5		8			3	1										1		
Cairo	C					3																
	D					3																
Port Said	C			1		1																
Ireland (Irish Free State):																						
Cork County	C					3			1													
Donegal County, Letterkenny	C			4																		
Mexico:																						
Guadalajara	D					1																
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	4	4	4	3	2	1		2	1		4	3	6	6		
	D				2	1	1	3	1								3	1		3		
Monterey	D																			1		
Morocco	C								107	235	257	214	370	210	141			175	172	167	219	
Palestine	C	11	1	5	3	9				8		2	2	1	1	2	6	1	5			
Poland	C	50	35	19	64	93	26	33	68	68	101	92	87	66	57	62	57	89				2
	D	6	2	4	11	10	1	3	6	6	4	3	5	7	10	3	7	6				
Portugal: Oporto	C	1			1									1								
Rumania	C	36	16	17	22	35	32	17	19				15	24		14	26	28				
	D	1		2				2	1				2	7			4	1				
Syria: Aleppo	C		2						2													
Tunisia	C	14	1	3	1	1	1			5	4				1				13			
Union of South Africa:																						
Cape Province	C	P	P	P	P	P	P	1	P		P	P	1	P	P	P						
Natal	C	P	P	P	P	2	2	P	P	1		P		1	P	P						
Orange Free State	C			P		P							P	P	P	P						
Transvaal	C	1		5	P	P																
On vessel: S. S. Gaika at Durban, Natal—from Mauritius	C																	1				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		1927				November, 1927			December, 1927			January, 1928			February, 1928		
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Algeria	C	67	33	10	12												
	D	13			1												
Algiers	C	2	2	6	2												
Bulgaria	C	12	24	7	2						2	7	6		8	12	6
	D		1	2	1						1		1		1	2	2
Morocco	C	148	76	7	11	5	14	7	5	6	75						

Place		July-September	October	November	December	January	February
Argentina: Rosario	C			1			
	D				1	1	
China: Shanghai	D			1			
Chosen	C	90	16	26	38	183	
	D	8	1	2	3	19	
Chemulpo	C	3				1	
Gensan	C	2				1	
	D					1	
Seoul	C	5	2				
	D	1	1				
Czechoslovakia	C	12	1		6		
Greece: Athens	C	3			1	2	2
Japan	C	1		1			
Latvia	C	6					1

Place		July-September	October	November	December	January	February
Lithuania	C	69	9	18	27	86	137
	D	14	1	1	1	10	12
Mexico	D	64	36	29			
Peru:							
Arequipa	D	3	2		1	2	
Lima	D	8					
U. S. S. R.:							
Railways, etc	C	77	23	33	46		
Transcaucasus, Siberia, and Central Asia	C	208	61	49	80		
Ukraine	C	295	151	198	282		
Other territories in Europe	C	1,839	521		1,408		
Yugoslavia	C	29	1	1		7	
	D	5				3	

YELLOW FEVER

[C indicates cases; D, deaths, P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
Ashanti: Obuasi	C		1																	
	D		1																	
Belgian Congo:																				
Boma	C											3								
	D											2								
Matadi	C											6	12	11	1	5	8			1
	D											2	6	8	2	5	6			
Dahomey:																				
Grand Popo	C						1													
	D						1													
Porto Novo	C	1																		
	D	1																		
Ivory Coast	C	1									1									
	D	1									1									
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	38														
	D	3	9	21	31	28														
Dakar	C	1			12	14	2	1	4			1	1							
	D				7	10	2	1	4			1	1							
Togoland	C		1																	
	D		1																	

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

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TREASURY DEPARTMENT

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ISSUED WEEKLY

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SPECIAL ARTICLES

Meningococcus Meningitis in the United States
Incidence of Various Diseases According to Age

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

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CONTENTS

PUBLIC HEALTH REPORTS

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MENINGOCOCCUS MENINGITIS IN THE UNITED STATES

An increase in the number of cases of meningococcus meningitis this year over the corresponding period of last year has been noted in the Public Health Reports (issues of April 6, 1928, p. 807, and April 27, 1928, p. 999).

During the eight weeks from March 4 to April 28, 1928, and the corresponding eight weeks of 1926 and 1927, forty-two States reported cases of meningococcus meningitis as follows:

	Cases
1926	438
1927	477
1928	1,036

These States had an estimated population of more than 104,000,000 in 1927.

The disease appears to be decreasing in the Mountain States, which have reported the highest case rates.

Reports of deaths for the year 1928 are available only from cities. The following table shows the numbers of cases of meningococcus meningitis and deaths from this disease reported by 7 large cities for the first 17 weeks of 1927 and 1928. The cities were selected for the reason that they reported a considerable number of cases.

Meningococcus meningitis cases and deaths reported by certain cities, January 1 to April 28, 1928, and corresponding period of 1927

	1927		1928			1927		1928	
	Cases	Deaths	Cases	Deaths		Cases	Deaths	Cases	Deaths
Chicago	50	23	133	66	New York City	77	46	284	148
Cleveland	8	3	29	9	St. Louis	14	4	44	16
Detroit	17	12	22	24					
Kansas City, Mo.	5	3	34	16	Total	242	125	587	304
Milwaukee	71	34	41	25					

It should be noted that, while the increase over preceding years is considerable, the number of cases is not large in proportion to the population.

THE INCIDENCE OF VARIOUS DISEASES ACCORDING TO AGE [1]

Hagerstown Morbidity Studies No. VIII [2]

By EDGAR SYDENSTRICKER, *Statistician, United States Public Health Service*

In this report it is proposed to place on record in some detail the results of the morbidity study in Hagerstown, Md , which bear upon the incidence of various diseases and conditions at different

The data are too voluminous to permit of a detailed discussion of each disease or a comparison with other morbidity records in a short paper. It is believed, however, that they will be of interest as they stand, not merely for the reason that they add to our morbidity experience, but also, and perhaps especially, because they are the results of the first study, of which we are aware, of the *incidence* of illness and disease during a period as long as 28 months in a general population group composed of persons as found in their homes—that is, of both sexes, all ages, engaged in the ordinary occupations of life, in a fairly typical inland small city in the eastern section of the United States

I. Scope and Method of the Study and Definition of Illness and Disease

The scope and method of the study have been discussed in detail in the first paper of this series and need not be repeated here except in so far as they may affect some particular phase of the results here presented. For proper interpretation of the data, however, it may be well to invite attention to certain definitions and procedures, as follows:

1. For every case of illness recorded, an attempt was made to obtain as complete a statement as possible of the specific disease or diseases responsible for it or of the condition which most accurately described it. Only 170, or less than one per cent, of the 17,847 illnesses had to be classified as "ill-defined and unknown." Of the total number (17,217) for which information as to medical and other service was avialable, 7,953, or 46 per cent, were attended by physicians, and in practically

[1] From the Office of Statistical Investigations, United States Public Health Service

[2] Other Hagerstown morbidity studies published are—

I A Study of Illness in a General Population Group Method of Study and General Results Pub. Health Rep , vol 41, No 39, Sept 24, 1926 Reprint No 1113

II The Reporting of Notifiable Diseases in a Typical Small City Pub Health Rep , Vol 41, No 41, Oct 8, 1926 Reprint No 1116

III The Extent of Medical and Hospital Service in a Typical Small City Pub Health Rep , Vol 42, No 2, Jan 14, 1927, Reprint No 1134

IV The Age Curve of Illness Pub Health Rep., vol. 42, No 23, June 10, 1927 Reprint No 1163

V A comparison of the Incidence of Illness and Death Pub Health Rep , vol 42, No 25, June 24, 1927. Reprint No 1167

VI The Illness Rate Among Males and Females Pub Health Rep , vol. 42, No 30, July 29, 1927. Reprint No 1172

VII The Causes of Illness at Different Ages Pub Health Repts , vol. 43, No. —.

all of these cases the diagnosis given by the informant at the home was reviewed by the attending physician shortly after the visit was made. If we omit "colds" and minor digestive disturbances, which numbered about 7,500, 65 per cent of the illnesses were attended and the diagnoses were reviewed by physicians. The facts that repeated visits were made to the same households and that 67 per cent of the total population enumerated were observed for at least 24 of the 28 months, are evidence, we believe, of a real attempt to ascertain not only the incidence, but also the cause of illness.[3]

2. In the interpretation of the data presented in this paper it is essential to keep in mind the following qualification: *The measure of the incidence of any specific disease was the extent to which it manifested itself in illness.* If it did not manifest itself in illness, it was not observed and, therefore, was not recorded. It follows, of course, that our results are not comparable with the results of intensive medical or physical examinations, and that defects and conditions indicative of ill health are not revealed unless they were major causes of illnesses recorded. Similarly, those morbid conditions which ordinarily are described as "below par," "not feeling very well," etc., or were of short duration and occasioned little discomfort, were not recorded. For example, many minor respiratory attacks were not reported. Less than 5 per cent of the illnesses for which exact durations were stated were one day or less in duration. Comparisons of our results with other morbidity records indicate that, in general, the illnesses we recorded were those which lasted over two days.

Thus the definition of "illness" employed in this study was not, as we have already pointed out, rigidly precise. The records obtained were of illnesses as reported by the household informant (usually the wife), either as experienced by herself or as she observed them in her family; thus the definition of the term can not be refined any further than the common understanding of the word. Furthermore, the records as obtained were of *attacks*, rather than illness in

[3] *Per cent of persons observed for specified number of months in the Hagerstown morbidity study*

Number of months under observation	Persons under observation specified number of months	
	Number	Per cent of total
28 months	3,202	37.3
26 months or more	5,140	49.8
24 months or more	5,787	67.4
18 months or more	6,824	79.5
14 months or more	7,528	87.7
12 months or more	7,794	90.8
9 months or more	8,085	94.2
6 months or more	8,340	97.1
4 months or more	8,431	98.2

the sense of ill health. As already emphasized, of those persons affected with some chronic condition, only those who suffered ill effects of this condition *during the period* came to notice. "Normal" reactions of the individual, considered by some as not symptoms of disease, although accompanied by some discomfort, may be said to be unrecorded. Although the reader is cautioned against putting too fine a point on this definition of illness, we believe that the illness recorded undoubtedly was a fairly accurate indication of disease incidence.

3. In only 660, or 3.7 per cent, of the total illnesses was more than one cause or condition recorded. One reason for the comparatively small number of cases with "contributory" and "joint" causes was the method used in classification. Sometimes the informant mentioned more than one condition in telling about an illness; but when these conditions were in the nature of symptoms which simply amplified the information as regards a single cause of illness, they were not tabulated as complications or contributory causes. For example, a person may have reported "indigestion" and a "headache" as the cause of illness, but only the "indigestion" was used to denote the condition. In other words, *symptoms* were not made contributory causes unless it seemed quite certain that they apparently represented a condition *separate* and *distinct* from the primary diagnosis. In such cases, symptomatic indications were tabulated as disease entities, even though they were sometimes complications of the primary disease. Thus, in the case of "colds" and "indigestion," the cold was made primary, but the indigestion was tabulated as a complication.

In the tables on the incidence of specific diseases which are presented in this paper, *both primary and contributory causes* are given as distinct diseases or conditions. Thus, in the foregoing instance, the "cold" is included under its appropriate title and "indigestion" under its appropriate title also.

The age groupings were chosen with the primary purpose of exhibiting the characteristic age curves of the various diseases. This was a rather difficult thing to do, and in some instances the groupings are probably not the best suited. It was thought best to retain one age classification throughout, however, except for a few diseases for which additional tables and graphs are given.

II. The Record of Diseases and Conditions

The basic data used in this report are given in Table A, entitled "Number of illnesses, by age groups, in which specified diseases or conditions were the sole or primary or contributory cause in a group of white persons in Hagerstown, Md., observed from December 1, 1921, to April 1, 1924."

The data are presented in considerable detail in order that they may be available to those who wish to use the statistics in various ways. For several diseases the numbers according to age groups are too small to yield dependable indications of age variations, but they are given for what they are worth in themselves, as well as to enable the student to make combinations to suit his particular purpose.

TABLE A.—*Number of illnesses, by age groups, in which specified diseases or conditions were the sole or primary or contributory cause in a group of white persons observed in Hagerstown, Md., December 1, 1921–March 31, 1924*

Disease or condition (numbers in parentheses refer to those given in the International List of Causes of Death, 1920)	Number of illnesses in which the specified disease or condition was a cause							
	All ages [1]	Age group						
		0–4	5–9	10–14	15–24	25–44	45–64	65+
Years of life observed	16,517	1,777	2,105	1,713	2,526	4,643	2,575	810
Epidemic, endemic, and infectious diseases (1–42, except 11 and 31)	1,465	628	618	87	40	53	26	8
Typhoid fever (1)	19	1	4	5	3	3	2	1
Measles (7)	568	273	261	28	4	2		
Scarlet fever (8)	34	9	16	7	2			
Whooping cough (9)	374	209	142	12	3	4	3	
Diphtheria (10)	45	11	18	7	2	5	2	
Cholera nostras (15)	36	1	1	4	5	11	11	3
Chicken pox (25a)	232	106	115	10		1		
German measles (25b)	18	3	12	2		1		
Tuberculosis, nonpulmonary (32–37)	14		1	1	3	9		
Other diseases in this group (2–6, 12–14, 16–24, 26–30, 38–42)	125	15	48	11	18	17	8	4
General diseases (43–69)	381	6	15	14	22	108	150	63
Cancer (43–49)	22					6	10	5
Rheumatism, acute and chronic (51, 52)	290	1	11	11	17	75	114	55
Diabetes (57)	16					1	14	1
Others (50, 53–56, 58–69)	53	5	4	3	5	21	12	2
Diseases of the nervous system (70–84, part of 205)	802	11	47	89	72	269	225	72
Cerebral hemorrhage and apoplexy (74)	15	1				2	3	8
Paralysis (75)	27			1		1	8	16
Epilepsy (78)	11	1		4	2	3	1	
Chorea (81)	20		3	14	2		1	
Neuralgia (part of 82)	121	1	3	4	9	52	36	12
Neuritis and sciatica (part of 82)	95				8	39	41	9
Neurasthenia and nervous exhaustion (part of 84)	216	3	7	10	25	79	69	17
Headache (part of 82 and 205)	251	2	31	52	18	80	59	7
Other nervous diseases (71–73, 76, 77, 79–80, 83, part of 82, 84)	46	3	3	4	13	13	7	3
Diseases of the eyes and annexa (85)	139	15	34	29	11	25	17	6
Pink eye	33	4	9	9	2	5	3	
Conjunctivitis (other)	19	5	3	4		2	5	
Sty	18	3	4	3	2	6		
Sore eye and "other eye"	69	3	18	13	7	12	9	6
Diseases of ears and mastoid process (86)	248	72	78	45	20	24	6	2
Otitis media	166	66	44	27	7	20	4	1
Mastoiditis	11		3		6	2		
Earache	53	7	26	14	4			1

[1] Including unknown ages.

Table A.—*Number of illnesses, by age groups, in which specified diseases or conditions were the sole or primary or contributory cause in a group of white persons observed in Hagerstown, Md., December 1, 1921–March 31, 1924*—Continued

Disease or condition (numbers in parentheses refer to those given in the International List of Causes of Death, 1920)	Number of illnesses in which the specified disease or condition was a cause							
	All ages	Age group						
		0-4	5-9	10-14	15-24	25-44	45-64	65+
Diseases of circulatory system (87-96)	397	22	23	31	28	73	113	95
Diseases of the heart (87-90)	222		5	17	18	45	65	60
Arteriosclerosis (part of 91)	32						4	28
Hemorrhoids (part of 93)	18				1	9	8	
Adenitis (part of 94)	57	21	13	11	6	4	2	
Nosebleed and other hemorrhage (95)	17	1	4	1	1		7	3
High blood pressure (part of 96)	30				1	4	21	4
Other diseases of circulatory system (part of 91, 92, 93, 94, and 96)	21		1	2	1	11	6	
Total respiratory (excluding operations) (11, 31, 97-107, 109)	10,976	1,651	1,923	1,336	1,255	2,641	1,520	484
Influenza and grippe (11)	2,382	206	343	278	272	755	385	107
Pneumonia (100, 101)	144	71	20	12	5	14	14	8
Pleurisy (102)	38	2	4	1	6	10	12	3
Diseases of the pharynx (109)	1,101	79	322	266	175	181	53	9
Tonsillitis	472	55	118	106	[illegible]	87	18	3
Sore throat	431	15	166	129	55	42	17	4
Quinsy	55		4	5	13	23	4	
Other diseases of pharynx	143	9	34	26	24	29	14	2
Diseases of the larynx (98)	188	36	52	15	11	36	32	6
Croup	88	32	44	9	1	1	1	
Laryngitis	84	4	8	4	7	31	25	5
Other diseases of larynx	16			2	3	4	6	
Hay fever (part of 107)	33				7	11	9	6
Asthma (105)	67		1	9	7	24	14	10
Tuberculosis, pulmonary (31)	55		1	1	14	25	8	1
Other diseases of respiratory system (including head colds, chest and bronchial conditions) (97, 99, 103, part of 107)	6,968	1,257	1,180	754	758	1,585	1,002	336
Coryza [1]	1,791	352	286	200	180	462	215	67
Bronchitis, acute and chronic [1]	1,019	262	191	81	69	199	146	62
Chest colds, cough, and bronchial conditions [1]	440	87	79	42	32	99	72	25
Tonsillectomy and (or) adenoidectomy	120	13	66	17	13	10	1	
Other operations on throat and nasal fossæ	8				4	2	1	
Diseases of teeth and gums (part of 108)	136	2	21	32	21	42	16	2
Teeth abscess	53	1	4	11	12	17	8	
Toothache	48	1	12	18	6	11		
Diseases and disorders of the digestive system (110-127, part of 108 and 205)	1,685	282	312	223	156	331	281	82
Ulcers of stomach and duodenum (111)	12				1	5	6	
Indigestion, "upset stomach" and nervous indigestion (part of 112)	739	123	164	101	62	133	114	39
"Stomach trouble" and nausea (part of 112)	137	13	40	24	7	25	19	8
Diarrhea (113, 114)	219	104	16	17	16	38	21	6
Intestinal parasites (116)	23	13	7	2		1		
Appendicitis (117)	99	1	9	13	31	25	16	
Hernia (118a)	27	1	1	1	1	8	12	3
Constipation (part of 119)	14	2				6	3	3
Other intestinal, including obstructions (part of 118 and 119)	25	2	2	5	2	4	9	1
Biliary calculi (123)	72			1	6	37	20	2
Cholecystitis (part of 124)	32		1	1		8	16	6
Jaundice (part of 124)	45	7	21	6	5	3	3	
Other diseases of the liver (part of 124)	31	1	2	2	1	3	16	6
"Biliousness" (part of 205)	172	8	44	47	22	20	22	9
Other diseases of the digestive system (110, 126, and 108 excluding teeth and gums)	38	7	5	3	2	15	4	2

[1] This record covers the period Feb. 1, 1923–Mar. 31, 1924, and relates to the following years of observations: 0-4, 972; 5-9, 1,054; 10-14, 860; 15-24, 1,233; 25-44, 2,287; 45-64, 1,267; 65+, 384; total, 8,248.

Table A.—*Number of illnesses, by age groups, in which specified diseases or conditions were the sole or primary or contributory cause in a group of white persons observed in Hagerstown, Md., December 1, 1921–March 31, 1924*—Continued

Disease or condition (numbers in parentheses refer to those given in the International List of Causes of Death, 1920)	Number of illnesses in which the specified disease or condition was a cause							
	All ages	Age group						
		0–4	5–9	10–14	15–24	25–44	45–64	65+
Diseases of kidney and annexa (128–134)	237	16	12	11	11	50	78	54
Nephritis (128, 129)	83	1	1	3	6	8	32	31
Kidney diseases, unqualified (131)	91	14	7	8	5	27	19	10
Calculi of urinary passages (132)	14	...	...	...	...	3	8	3
Cystitis (part of 133)	28	...	...	...	...	4	10	7
Bladder trouble (part of 133)	24	1	4	...	...	6	9	3
Other diseases of kidney and annexa (134)	2	...	...	...	...	2	...	...
Diseases of genito-urinary system (nonvenereal) (135–142)	215	2	3	14	43	98	45	6
Diseases of male organs	12	2	2	1	1	1	1	4
Salpingitis (138)	21	...	1	...	6	12	2	...
Tumors or cysts of ovary or uterus (137, 139)	18	...	...	...	3	11	2	1
Menstrual trouble (part of 141)	52	...	...	12	21	13	6	...
Menopause	41	...	...	...	...	15	24	...
Other diseases of female genital organs (140, part of 141, 142)	71	...	...	1	12	46	10	1
Puerperal state (143–150)	402	...	...	2	112	275	3	...
Abortion and stillbirth (part of 143)	33	...	...	1	4	28	...	...
Confinements	324	...	...	...	99	216	...	...
Other puerperal conditions (143–150)	45	...	...	1	9	31	3	...
Diseases of skin and cellular tissue (151-154, part of 205)	321	71	85	57	27	48	19	12
Furuncle (152)	77	6	19	11	12	20	6	2
Abscess (153)	31	3	4	3	4	13	3	1
Scabies and itch (part of 154)	24	6	8	10	...	...	...	...
Impetigo contagiosa (part of 154)	25	7	9	4	3	2	...	...
Sores on body (part of 205)	67	27	23	14	1	2	...	...
Hives and rash (part of 205)	48	14	13	6	5	4	5	1
Other and unqualified skin conditions (part of 154)	49	8	9	9	2	7	6	8
Diseases of bones and organs of locomotion (155–158, part of 205)	116	2	5	5	5	49	35	13
Lumbago, myalgia, myositis (part of 158)	52	1	3	2	...	22	19	5
Backache (part of 205)	33	...	...	1	2	19	9	5
Other diseases of bones or organs of locomotion (155, 156, part of 158)	26	1	2	2	3	8	7	3
Congenital malformations and infancy (159–163)	19	13	2	3	...	...	...	...
Senility (164)	14	...	...	...	...	...	...	14
External causes (165–203)	656	51	96	75	82	151	142	38
All poisonings (175, 176, 177)	46	6	10	8	4	13	2	2
Burns (178–179)	35	8	5	5	4	8	5	...
Cuts (184)	61	6	11	13	9	12	8	1
Falls (185)	73	5	6	9	8	15	18	10
Automobile, street, railroad, etc. (188)	56	4	8	2	10	15	14	1
Fractures, wounds, and other injuries (201, 202)	348	21	54	36	47	78	82	21
Other external causes (165–174, 181–182, 189, 190–196)	37	1	2	2	5	10	13	3
Ill-defined and unknown	170	47	18	16	11	36	27	11

III. Incidence Rates of Specific Diseases at Different Ages

In the following series of tables the age specific rates of the different diseases are given on an annual basis. The discussion is confined largely to brief explanatory comment and, in some instances, contains supplementary details; but we have relied upon the graphs to depict the principal results and indications that the data appear to yield. The number of cases and "years of life observed" upon which any rate is computed may be found by reference to Table A.

1. EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES

(Int. List. Nos 1–42, except 11 and 31)

TABLE 1

Diseases and conditions	Annual rate per 1,000							
	All ages	0–4	5–9	10–14	15–24	25–44	45–64	65 and over
Total	88.7	353.4	293.7	50 8	15.8	11.4	10.1	9.9
Typhoid	1.2	.6	1 9	2.9	1.2	.6	.8	1.2
Measles	34.4	153.6	124.0	16.3	1.6	.4	------	------
Scarlet fever	2.1	5.1	7.6	4.1	.8	------	------	------
Whooping cough	22.6	117.6	67.5	7.0	1.2	.9	1.2	------
Diphtheria	2.7	6.2	8.6	4.1	.8	1.1	.8	------
Cholera nostras	2.2	.6	.5	2.8	2.0	2.4	4.3	3.7
Chicken pox	4.0	59.7	54.6	5.8	------	.2	------	------
German measles	1.1	1.7	5.7	1.2	------	.2	------	------
Tuberculosis, nonpulmonary	1.8	------	.5	.6	1.2	1.9	------	------

Of the total 1,465 cases included under the above heading, 1,174 were measles, whooping cough, and chicken pox, so that the age curve for the total for the group is influenced largely by these three diseases. The number of cases of the other diseases are too small to yield dependable indications according to age although some of the rates are interesting from the viewpoint of interepidemic incidence.

In view of the fact that measles, whooping cough, and chicken pox were quite prevalent during the period of study, their actual incidence (as contrasted with the incompletely reported incidence usually available [4]) according to age is not without significance. The accom-

[4] The annual rates based on our records and annual rates based on reports of physicians to the local health department are compared below.

Observed and reported incidence of measles, whooping cough, and chicken pox in Hagerstown Md. December 1, 1921–March 31, 1924

Disease	Annual incidence per 1,000 as—	
	Observed in home visits	Reported by physicians
Measles	34.4	9.0
Whooping cough	22.6	3.3
Chicken pox	14.0	2.2

See Hagerstown Morbidity Studies No. II.

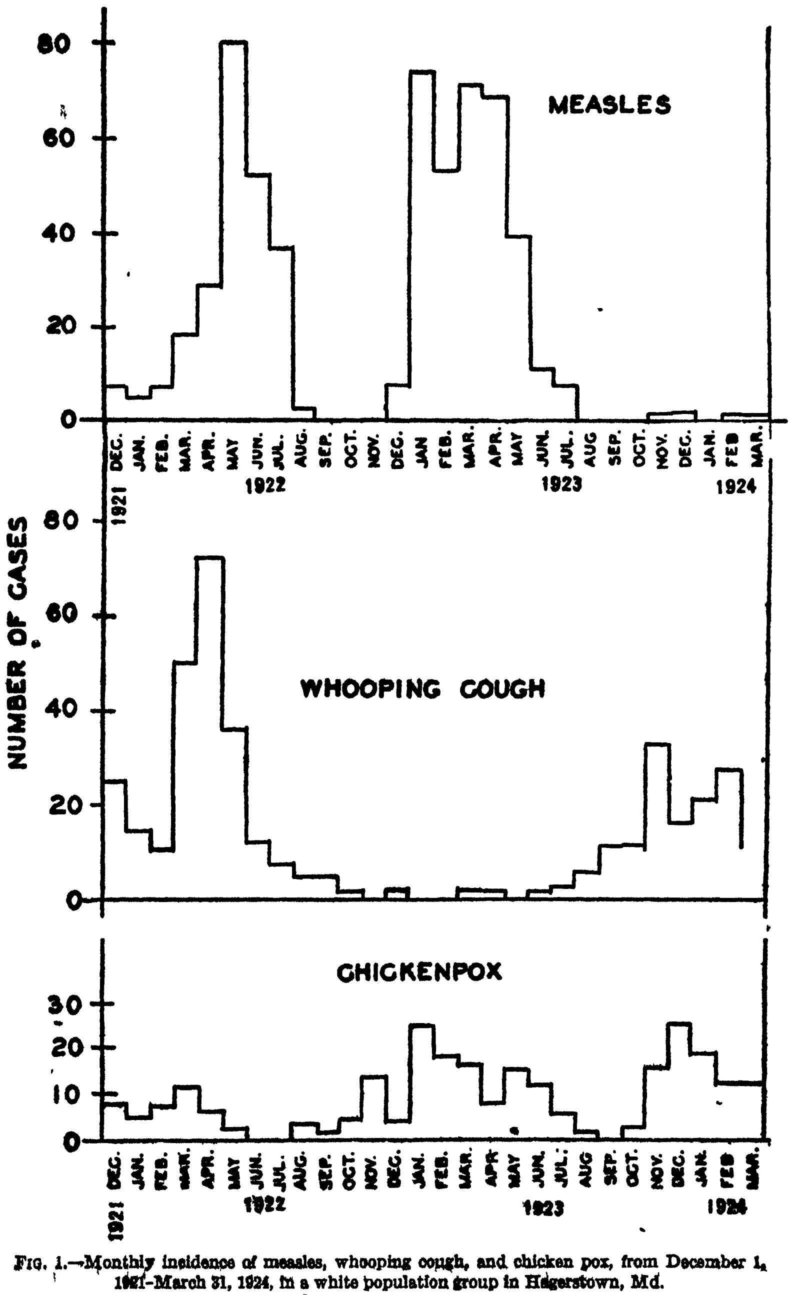

FIG. 1.—Monthly incidence of measles, whooping cough, and chicken pox, from December 1, 1921–March 31, 1924, in a white population group in Hagerstown, Md.

panying diagrams (fig. 1) exhibit the monthly numbers of cases and reveal a definitely epidemic prevalence of measles and whooping cough and perhaps of chicken pox.[5] For each of these diseases a more detailed tabulation according to age was made as follows:

TABLE 1a.—*Measles, whooping cough, and chicken pox*

Age	Annual rate per 1,000		
	Measles (568 cases)	Whooping cough (374 cases)	Chicken pox (232 cases)
Under 1 year	118	155	45
1 year	160	88	39
2 years	153	126	63
3 years	197	68	80
4 years	153	137	78
5 years	165	96	80
6 years	168	95	90
7 years	144	68	59
8 years	82	41	26
9 years	43	26	7
10 to 14 years	16	7	6
15 to 24 years	1.6	1.2	
25 to 44 years	.4	.9	.2
45 to 64 years		1.2	
65 years and over			

These rates have been plotted in Figure 2 and tell their own stories. The dotted lines were drawn by inspection and serve merely to suggest what the age curves might be if the irregularities due to small numbers were smoothed out.

2. "GENERAL" DISEASES

(Int. List Nos. 43-69)

TABLE 2

Diseases	Annual rate per 1,000							
	All ages	0-4	5-9	10-14	15-24	25-44	45-64	65 and over
Total	23.1	3.4	7.1	8.2	8.7	22.2	58.2	77.7
Cancer	1.3					1.3	3.9	6.2
Rheumatism	17.6	.6	5.2	6.4	6.7	16.2	44.3	67.9
Diabetes	1.0					.2	5.4	1.2
Others	3.2	2.8	1.9	1.8	2.0	4.5	4.7	2.5

The true prevalence of all diseases classifiable under this heading is not, of course, revealed by a record of the illnesses that they cause during a period of 28 months. The prevalence of acute rheumatism, which forms a large proportion of the total, is probably adequately

[5] The chronological variations in the incidence of illness from various causes will be presented in detail in a later paper.

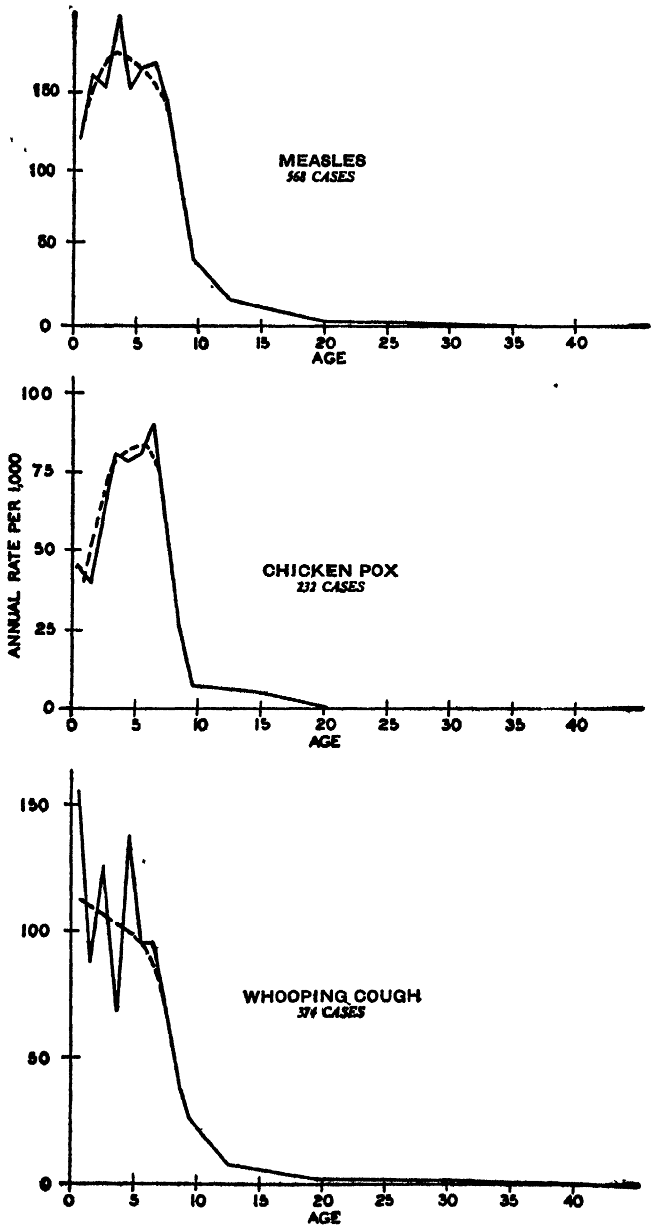

FIG. 2.—Incidence of measles, chicken pox, and whooping cough, among persons of different ages in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924. The dotted, smooth lines were drawn by inspection

recorded, but certainly this can not be said of diabetes or cancer. Our record of cancer and diabetes may be interpreted as indicating the prevalence of cases severe enough to require a physician's attendance, since every case recorded was attended by a physician. (See fig. 3.)

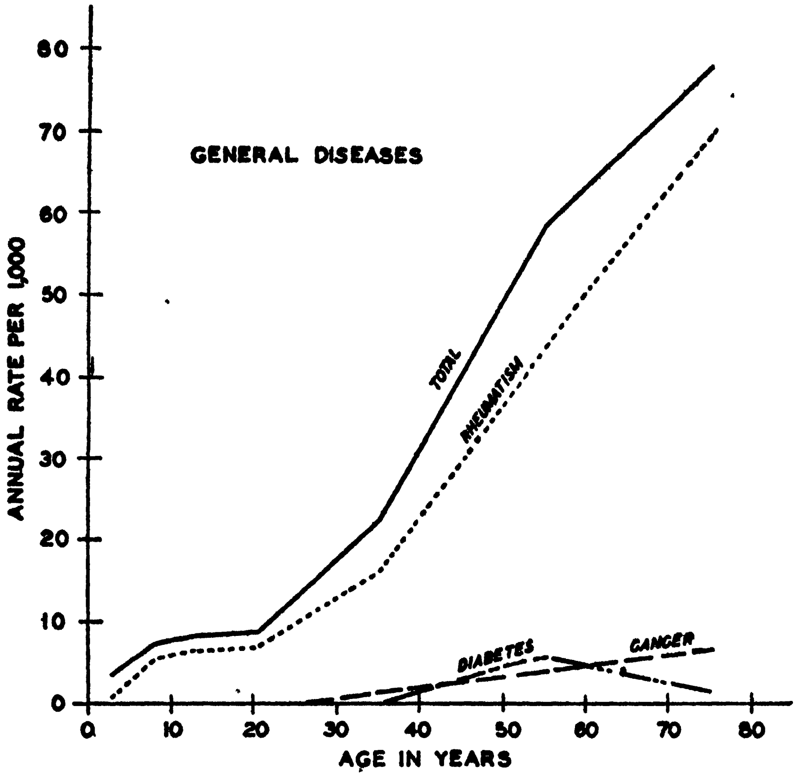

FIG 3 – Incidence of "general diseases" manifested in illness among persons of different ages in a white population group in Hagerstown, Md, December 1, 1921–March 31, 1924

3. DISEASES OF THE NERVOUS SYSTEM

(Int. List Nos 70–84, part of 205)

TABLE 3

Disease	Annual rate per 1,000							
	All ages	0–4	5–9	10–14	15–24	25–44	45–64	65 and over
Total	48.56	6.19	22.33	51.96	28.51	57.94	87.37	88.86
Apoplexy and cerebral hemorrhage	.91	.56				.43	1.16	9.87
Paralysis	1.63			.58		.22	3.11	19.75
Epilepsy	.67	.56		2.34	.79	.65	.39	
Chorea	1.21		1.43	8.17	.79		.39	
Neuralgia	7.83	.56	1.43	2.34	3.56	11.20	13.98	14.81
Neuritis and sciatica	5.75				1.19	8.40	15.92	11.11
Neurasthenia and nervous exhaustion	13.06	1.69	3.33	5.84	9.90	17.02	26.79	20.98
Headache	15.20	1.13	14.73	30.36	7.13	17.23	22.91	8.64
Other nervous conditions	2.78	1.69	1.43	2.34	5.15	2.80	2.72	3.70

The fact that "headache" is a symptom that characterizes no particular syndrome makes its inclusion under diseases of the nervous system rather doubtful. One has the choice of classifying illnesses described as "headaches" under "ill-defined and unknown" or of including them under some other group titles preferably (perhaps) the nervous system. We adopted the latter course after excluding, however, from the foregoing table all headaches that were reported as occurring in conjunction with a disease or condition of which headache may be a symptom. The rates given above are based on those indispositions and illnesses which were reported as "headache" without any other related condition, and the reader can reclassify them as he pleases. The other conditions specified in the table seem to be fairly definite from the diagnostic point of view, either because they are commonly recognized, as in the case of neuralgia or sciatica, or for the reason that the attending physician's diagnosis was recorded. The extent to which the specific conditions were attended by physicians is shown below:

TABLE 3a.—*Extent to which cases of nervous diseases and conditions resulting in illness were attended by physicians*

Disease or condition	Number of cases	Per cent attended by physicians
Apoplexy and cerebral hemorrhage	9	100
Paralysis	23	96
Epilepsy	9	56
Chorea	19	89
Neuralgia	100	38
Neuritis and sciatica	86	58
Neurasthenia and nervous exhaustion	164	80
Headache	237	11
Other nervous conditions	39	67

The age incidence of these conditions is shown graphically in Figure 4 and needs no further comment except on one or two details.

The high incidence of headache in the age group 10 to 14 is undoubtedly significant, although we are not able to say what specific condition it is directly associated with. It is corroborated by the more extensive records of absences due to "headaches" in the Hagerstown schools.[6]

[6] Collins (1) reported the following:

Sickness resulting in absence from school due to "headache and neuralgia" as reported by child or parent, in white schools, Hagerstown, Md., December, 1921–May, 1923

Age	Annual [a] rate per 1,000	Age	Annual [a] rate per 1,000
6	142	12	402
7	196	13	384
8	255	14	377
9	296	15	357
10	321	16–18	267
11	318		

[a] Per school year of 180 days

The rate quite definitely exhibited a maximum in the ages 10 to 14.

Whether or not all of the chorea was true chorea, it is impossible to say; all except two of the 19 cases were diagnosed by attending physicians, and all of the attacks were severe enough to result in illness. While 80 per cent of the cases recorded as "neurasthenia" and "nervous exhaustion" were so diagnosed by attending physicians, it is probable that this diagnosis was not infrequently used as a generic or vague term to designate a condition due to more specific causes. The higher incidence of paralysis than of apoplexy and cerebral

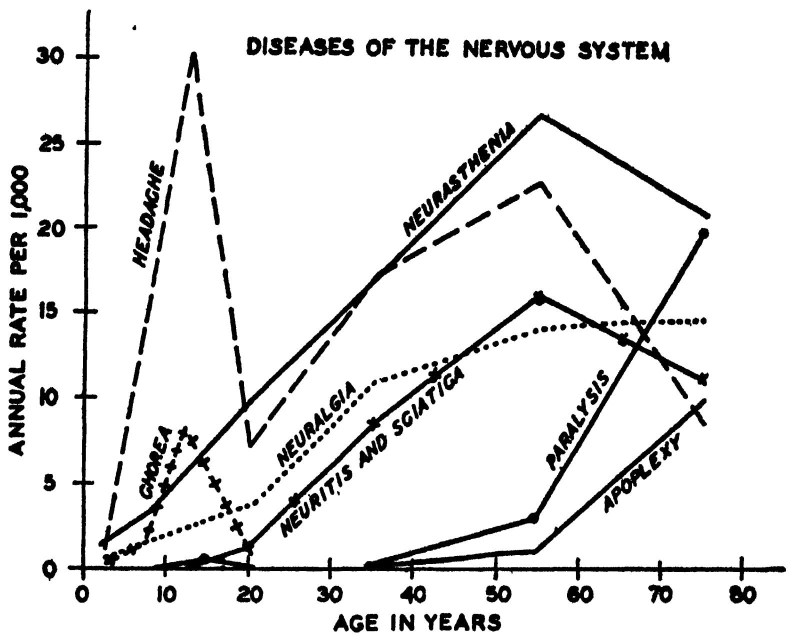

FIG. 4.—Incidence of certain diseases and conditions of the nervous system manifested in illness among persons of different ages in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

hemorrhage is due, of course, to the fact that the former included conditions continuing from lesions that occurred before our study was made, whereas the latter occurred during the 28 months of observation.

Lumbago and myalgia, in accordance with the International List of Causes of Death, are classified under "Diseases of the bones and organs of locomotion," but obviously belong with diseases of the nervous system. They are given immediately below.

4. DISEASES OF THE BONES AND ORGANS OF LOCOMOTION

(Int. List Nos 155-158; part of 205)

TABLE 4

Disease	Annual rate per 1,000							
	All ages	0-4	5-9	10-14	15-24	25-44	45-64	65 and over
Total	7.02	1.13	2.38	2.92	1.98	10.55	13.59	16.04
Lumbago, myalgia, myositis	3.15	.56	1.43	1.17	------	4.74	7.38	6.17
Backache (part of 205)	2.30	------	------	.58	.79	4.09	3.49	6.17

"Backache" may be regarded as a symptom of any of several causes or as an indeterminate name for lumbago. The "diseases of the bones" were too few to classify separately.

5. DISEASES AND CONDITIONS OF THE EYE AND ANNEXA

(Int List No 85)

TABLE 5

Disease	Annual rate per 1,000							
	All ages	0-4	5-9	10-14	15-24	25-44	45-64	65 and over
Total	8.42	8.44	16.16	16.93	4.46	5.38	6.60	7.40
Conjunctivitis, bacillary (pink eye)	2.00	2.25	4.28	5.25	.79	1.08	1.16	------
Conjunctivitis, other and "sore eye"	3.57	3.94	8.08	6.42	1.52	1.94	3.88	1.23
Sty	1.09	1.69	1.90	1.75	.79	1.29	------	------
Other "eye trouble"	1.70	.56	1.90	3.50	1.19	1.08	1.55	6.17

In the absence of adequate eye examinations, it is impossible of course to interpret the rates given above except in a very general way. Most of the conditions classified under "other eye trouble" were attended by physicians and were eye defects rather than acute attacks of disease. We may, therefore, roughly divide the incidence of the eye conditions recorded into two categories: (*a*) Those of an acute nature due principally to infections, such as sties, pink eye, and other forms of conjunctivitis, and (*b*) those due to defects. The rates for these two groups have been plotted in Fig. 5, as well as the curve for markedly defective vision (20/50 or worse in one or both eyes) which has been published for a large group by Collins and Britten (2). A comparison of the curve for defective vision with that for "other eye trouble" suggests that the conditions classified under the latter were due principally to defects. Although some of them occurred among children of school age, the "other eye troubles" increased with age; the incidence of acute disabilities, due princi-

pally to infections, on the other hand, occurred chiefly among children. The incidence of specific conditions in the latter group is shown graphically in Figure 6.

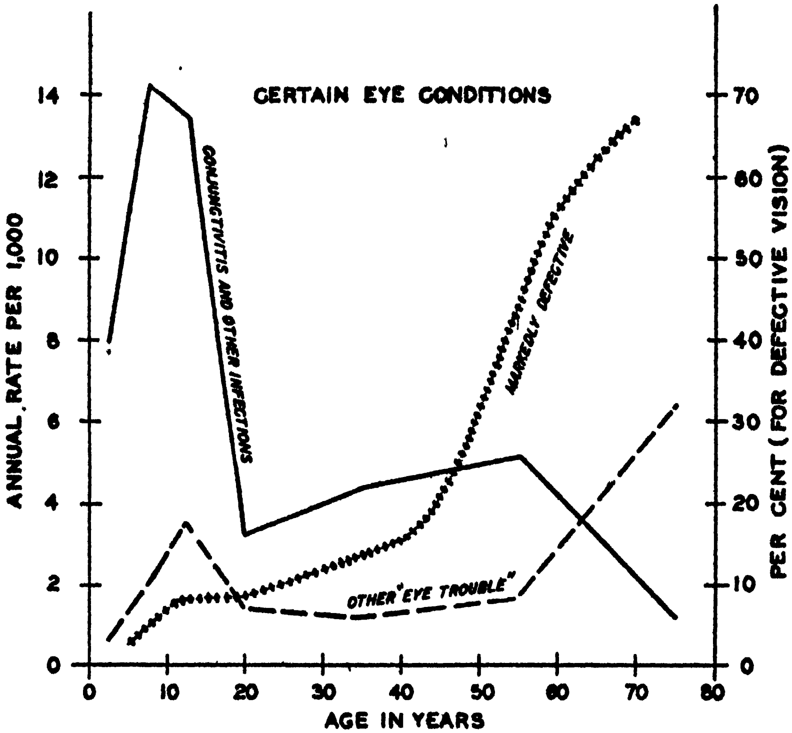

FIG. 5 —Incidence of certain eye conditions among persons of different ages in a white population group in Hagerstown, Md., and of markedly defective (20/50 or worse) vision according to Britten and Collins

6. DISEASES OF THE EAR AND MASTOID PROCESS

(Int. List No. 86)

TABLE 6

Disease	Annual rate per 1,000							
	All ages	0-4	5-9	10-14	15-24	25-44	45-64	65 and over
Total	15.01	40.52	37.06	26.27	7.92	5.17	2.33	2.47
Otitis media	10.05	35.46	20.91	15.76	2.77	4.31	1.55	1.23
Mastoiditis	.67		1.43		2.38	.43		
Earache	3.21	3.94	12.35	8.17	1.58			1.23

The fact that diseases of the ear so far as they are manifested in illness are largely confined to children is clearly apparent.

The record of absences in the Hagerstown schools due to "earache and ear diseases" (*1*) exhibits the same curve in greater detail for children of school age.

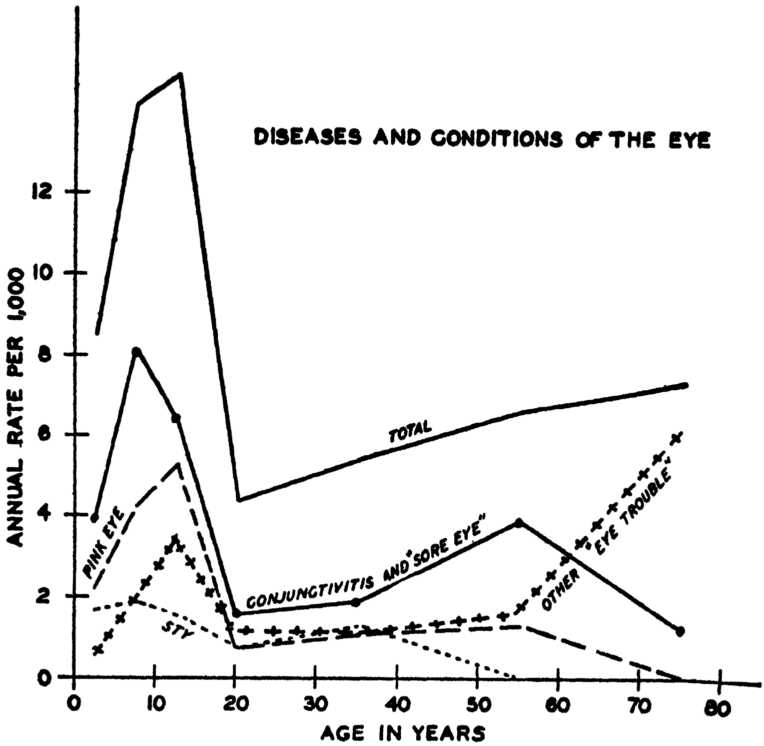

FIG 6.—Incidence of certain diseases and conditions of the eye manifested in illness among persons of different ages in a white population group in Hagerstown, Md, December 1, 1921–March 31, 1924

TABLE 6a.—*Absences due to "earache and ear diseases" in Hagerstown schools December, 1921–May, 1925*

Age	Earache and ear diseases		Earache		Ear diseases	
	Number of cases	Rate per 1,000 *	Number of cases	Rate per 1,000 *	Number of cases	Rate per 1,000 *
6	88	102	71	82	17	19.8
7	131	76	116	67	15	8.7
8	128	73	112	64	16	9.1
9	107	66	93	57	14	8.7
10	69	43	54	33	15	9.3
11	69	46	52	35	17	11.4
12	63	49	54	42	9	7.0
13	40	34	32	27	8	6.8
14	33	33	24	24	9	9.1
15	16	23	11	16	5	7.3
16-18	13	13	6	6	7	7.1

* Rate per 1,000 children per school year of 180 school days.

Otitis media was shown quite definitely to be a disease of children, and followed closely the curve of infectious diseases (fig. 7). The number of cases of mastoiditis is too small to offer any evidence as to variations in incidence according to age. "Earache" must be regarded as a symptomatic term under the general title of ear diseases and conditions. Its relatively infrequent occurrence among children under 5 years of age as compared with its higher incidence in the age

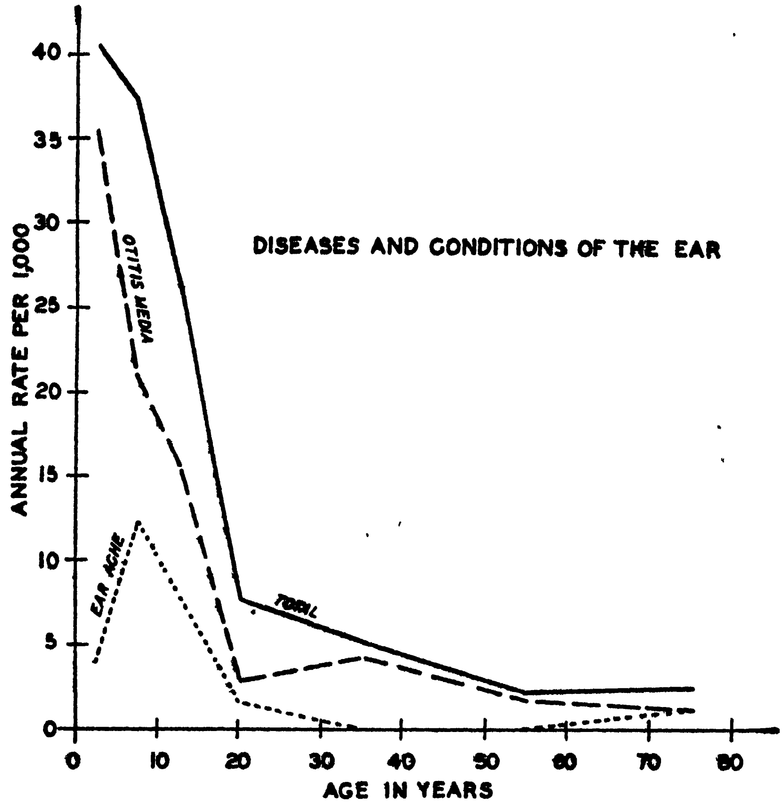

FIG. 7.—Incidence of certain diseases and conditions of the ear manifested in illness among persons of different ages in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

period 5 to 9 years is probably more apparent than real; it is doubtless due in part to the fact that it is a subjective rather than an objective symptom and in part probably to a tendency to call in a physician in cases of earache more frequently for younger children than for older. This possibly increases the recorded incidence of otitis media among young children.

7. DISEASES OF THE CIRCULATORY SYSTEM

(Int. List Nos. 87-96)

TABLE 7

Diseases and conditions	Annual rate per 1,000							
	All ages	0-4	5-9	10-14	15-24	25-44	45-64	65 and over
Total	24.04	12.38	10.93	18 10	11.09	15.72	43.88	117.24
Diseases of the heart	13.44		2.38	9 92	7.13	9.69	25.24	74.05
Arteriosclerosis	1 94						1.55	34.56
High blood pressure	1.82				.40	.86	8 15	4.94
Hemorrhoids	1.09				40	1 94	3.11	
Adenitis	3.45	11.82	6.18	6.42	2 38	.86	.78	
Nosebleed and other hemorrhage	1.03	.56	1.90	.58	.40		2.72	3.70
Other circulatory	1.27		.48	1.17	.40	2.37	2 33	

The caution already emphasized, that our data are not records of defects as discovered by medical examination and clinical observation but records of illness due to more or less specific conditions, is particularly pertinent in interpreting the age incidence of illnesses

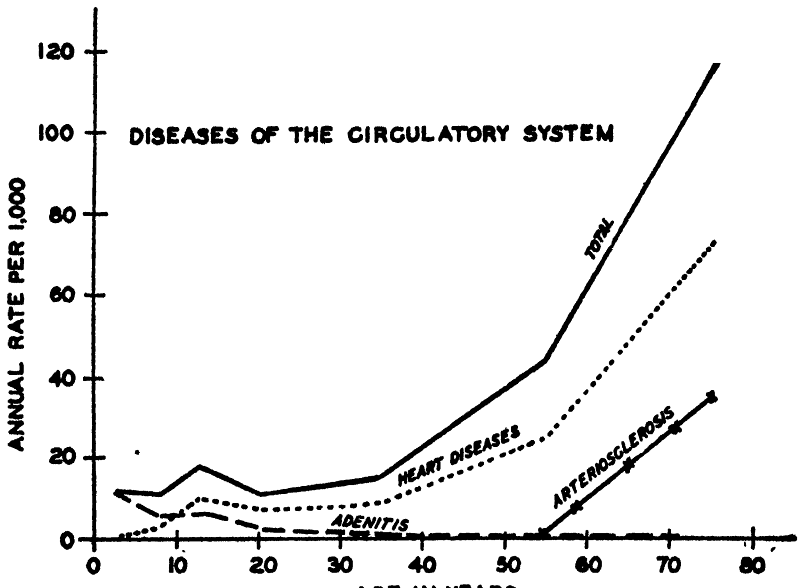

FIG. 8.—Incidence of diseases of the circulatory system manifested in illness among persons of different ages in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

due to circulatory diseases. Yet, for the most part, these illnesses were real disabilities, and 83 per cent of the 287 cases were attended by physicians.

The incidence of illness due to circulatory diseases and conditions among children and adolescents was due in part to glandular inflammation, especially in the ages under 10 years. (Fig. 8.) Diseases of the heart were relatively more frequent causes of illness in the age period 10–14 than at younger ages or until adult life, an indication

which is reflected in the age specific mortality rate for this group of causes. This indication appeared also in the records of absences due to heart conditions among the Hagerstown school children during (1) the period 1921–1925. Although the number of cases (60) is small, a variation according to age seems to be manifested within the school-age period, as follows:

TABLE 7a.—*Absences due to heart conditions in the Hagerstown schools, December, 1921, to May, 1925*

Age	Rate per 1,000 [a]	Number of cases	Age	Rate per 1,000 [a]	Number of cases
6	3.5	3	12	7.7	10
7	1.2	2	13	5.1	6
8	2.8	5	14	7.0	7
9	1.9	3	15	2.9	2
10	5.6	9	16–18	3.0	3
11	6.7	10			

[a] Rate per 1,000 children per school year of 180 school days.

The familiar rise in prevalence of heart disease in middle and old age is evidenced in these morbidity records as well as in mortality experience, but the rise of mortality from heart disease as age advances is at a much more rapid rate than that of the morbidity rate. If we compare the curve shown in Figure 8 with the mortality curve, for example, in the original registration States for 1920, the ratio of illnesses to deaths is about 30 at 15–24 years, 20 at 25–44, 8 at 45–64, and only 2 after 64 years.

8. RESPIRATORY DISEASES

(Int. List Nos. 11, 31, 97–107, 109)

TABLE 8

Disease or condition	Annual rate per 1,000: All ages	Under 5	5–9	10–14	15–24	25–44	45–64	65 and over
Total	664.5	929.2	913.8	779.9	496.9	568.8	593.7	597.3
Influenza and grippe	114.2	115.9	163.0	162.3	107.7	162.6	149.5	132.0
Pneumonia	8.7	40.0	9.5	7.0	2.0	3.0	5.4	9.9
Pleurisy	2.3	1.1	1.9	.6	2.4	2.2	4.7	3.7
Diseases of the pharynx	66.7	44.5	153.0	155.3	69.3	39.0	20.6	11.1
Tonsillitis	28.6	31.0	56.1	61.9	32.9	18.7	7.0	3.7
Sore throat	26.1	8.4	78.9	75.3	21.8	9.0	6.6	4.9
Quinsy	3.3	------	1.9	2.9	5.1	5.0	1.6	------
Other pharynx	8.7	5.1	16.2	15.2	9.5	6.2	5.4	2.5
Diseases of the larynx	11.4	20.3	24.7	8.8	4.4	7.5	12.4	6.2
Croup	5.3	18.0	20.9	5.3	.4	.2	.4	------
Laryngitis	5.1	2.3	3.8	2.3	2.8	6.7	9.7	6.2
Other diseases of the larynx	1.0	------	------	1.2	1.2	.9	2.3	------
Hay fever	2.0	------	------	------	2.8	2.4	3.5	6.2
Asthma	4.1	------	.5	5.3	2.8	5.2	5.4	12.3
Pulmonary tuberculosis	3.3	------	.5	.6	5.5	5.4	3.1	1.2
Other diseases of the respiratory system (including head colds, chest, and bronchial conditions)	421.9	707.5	560.7	440.2	300.1	341.4	389.1	414.7
Coryza [a]	217.1	362.2	271.5	232.6	146.0	202.0	169.7	174.7
Bronchitis (acute and chronic) [a]	123.5	269.6	181.3	94.2	56.0	87.0	115.2	161.7
Chest colds, coughs, and bronchial conditions [a]	53.3	82.5	75.0	48.9	20.0	43.2	56.3	66.2
Tonsillectomy and (or) adenoidectomy	7.3	7.3	31.4	9.9	5.1	2.2	.4	------
Other operations of nasal fossae	.5	------	------	------	1.6	.4	.4	------

[a] Based on records from February 1, 1923–March 31, 1924.

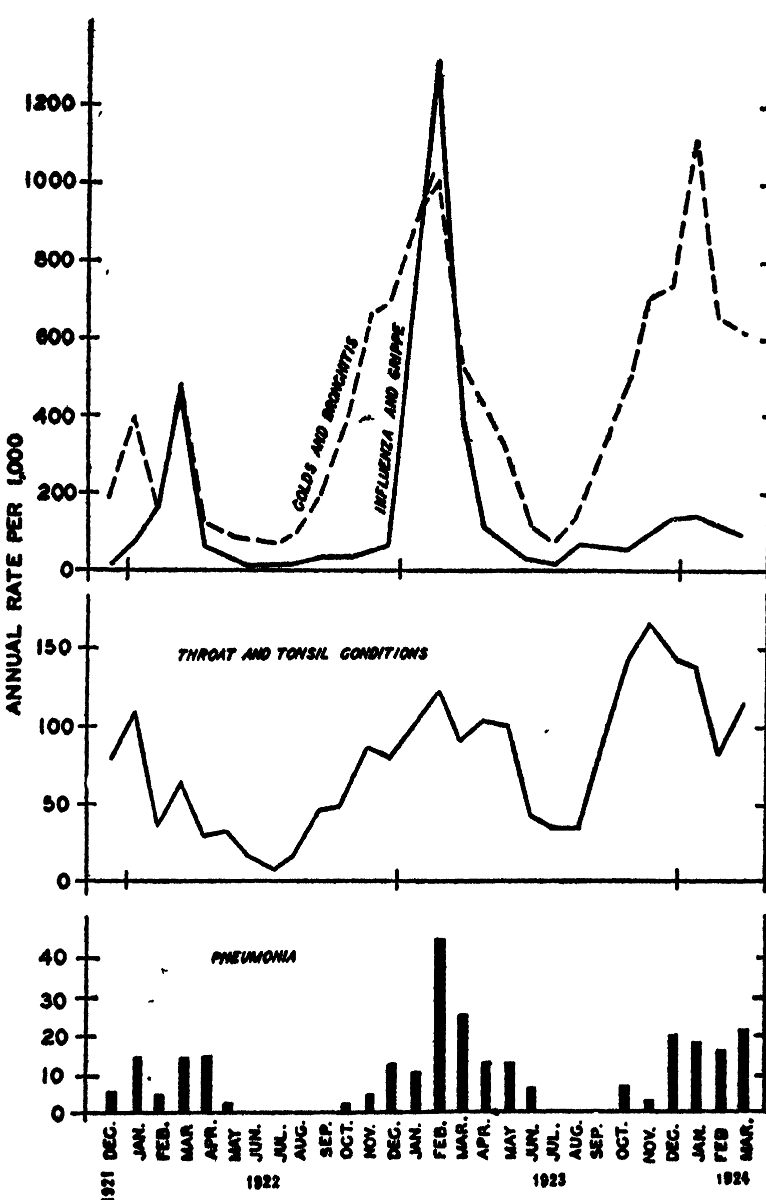

FIG. 9.—Monthly incidence of certain respiratory diseases and conditions in a white population group in Hagerstown, Md., December 1, 1921-March 31, 1924

Many minor respiratory affections were not included in the records we obtained. This was evident at the time the study was made, and is also shown to be true by later studies of the United States Public Health Service, which, by obtaining reports at much shorter intervals, showed the respiratory rate to be much higher than that recorded for the Hagerstown group.[7] Again, attention may be invited to the fact that nearly all the cases recorded in the Hagerstown study were illnesses in the common understanding of the term and, therefore, excluded respiratory attacks which, however definite they may have been clinically, were not accompanied by that degree of malaise which ordinarily is denoted as illness.

Since only 34 per cent of the respiratory cases recorded were attended by physicians, it was difficult to designate many of them by a more specific diagnostic term than that which the lay informant would ordinarily use. During the first half of the study we obtained information that was specific enough to make a rough classification into (1) influenza and grippe, (2) pneumonia, (3) pleurisy, (4) tonsillitis, (5) sore throat, (6) quinsy, (7) other diseases of the pharynx, (8) hay fever, (9) asthma, and (10) pulmonary tuberculosis. The remainder were grouped under a general heading (11) "Other diseases of the respiratory system" which included bronchitis, "bronchial colds and coughs," "chest colds," etc. In the second half of the study an attempt was made to obtain more specific information with the result that we were able to refine our classification and add the following: (12) Coryza and rhinitis, (13) bronchitis, and (14) "chest colds," "cough," and "bronchial conditions." This refinement probably had the additional effect of increasing the number of specific tonsil and throat conditions in the second 14 months of our study over what would have been recorded had no change in method of inquiry been made.

As the classification finally stands, however, we feel that the differentiations are roughly accurate from the point of view of present clinical knowledge. Obviously the distinction between "colds" and "influenza and grippe" is not clear, as the accompanying graphs of their monthly incidence suggest (fig. 9), since peaks in "colds" occur simultaneously with peaks in influenza. The age curves for the two conditions (fig. 10) are also quite similar, except for children under 5 years of age—an exception that can be accounted for by the inability of small children to tell the subjective symptoms ordinarily associated with influenza or grippe. But the other classes or kinds of

[7] A study based on semimonthly reports from a group of medical officers of the Army, Navy, and Public Health Service and members of several college faculties upon the incidence of respiratory attacks among themselves and members of their families showed a rate of 2.009 per 1,000 during 1924 (3). A similar study for several thousand college students reporting upon themselves showed a rate of 2,877 per 1,000 during the period June 1, 1924–May 30, 1925.

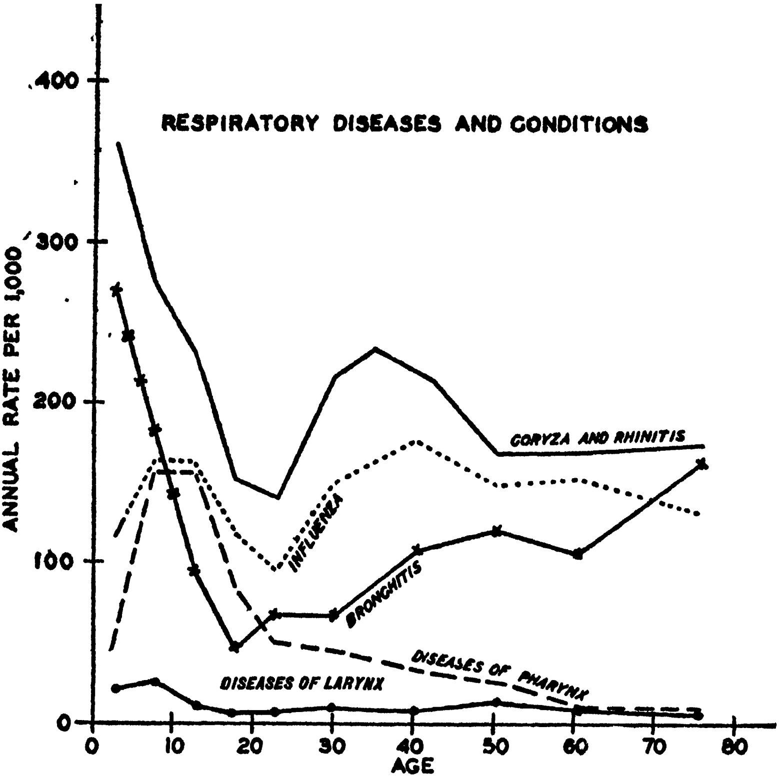

FIG 10.—Incidence of respiratory diseases and conditions manifested in illness among persons of different ages in a white population group in Hagerstown, Md, December 1, 1921–March 31, 1924

respiratory affections and diseases seem to be fairly well differentiated. In the first place, a considerable proportion of each were diagnosed by attending physicians, as the following table shows:

TABLE 8a.—*Proportion of cases of various respiratory diseases that were attended by physicians*

Disease or condition	Number of cases	Per cent attended by physicians
Pulmonary tuberculosis	48	98
Pneumonia	111	97
Pleurisy	33	88
Tonsillitis	465	73
Influenza and grippe	2,317	67
Other diseases of the pharynx	99	65
Hay fever and asthma	86	47
Laryngitis	92	36
Croup	86	33
Sore throat	497	21
Colds, unqualified	828	14
Coryza	1,780	7

In the second place, the age curves suggest fairly definite differences. Referring first to Figure 10, bronchitis is in clear distinction to coryza and to influenza on the one hand, and to diseases of the pharynx and larynx on the other hand. Considering tonsil and throat conditions (fig. 11), the age curves for pharyngeal conditions is quite different from those for laryngitis and also for croup.[8]

The number of cases of asthma, hay fever, pleurisy, and tuberculosis is perhaps too small to be of general interest, but the rates

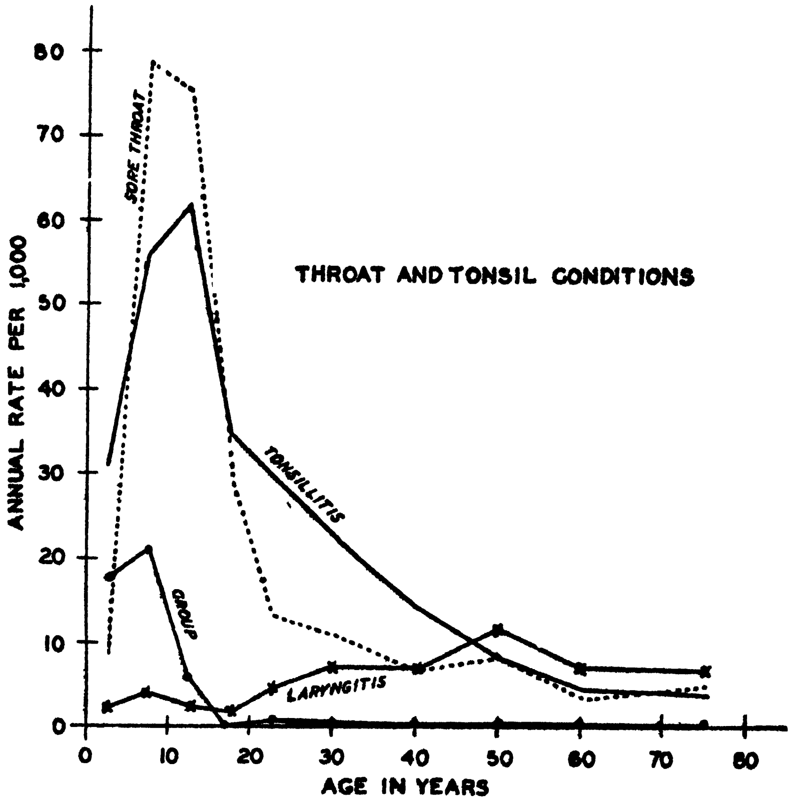

FIG 11 —Incidence of throat and tonsil conditions manifested in illness among persons of different ages in a white population group in Hagerstown, Md*, December 1, 1921-March 31, 1924

are plotted in Figure 12 as a record of our experience. In general, they conform to the indications afforded by such other morbidity data as are available. With respect to tuberculosis, it may be pointed out that only active cases resulting in some degree of disability during the period of observation were recorded.

[8] The epidemiological and etiological evidence bearing on this point is presented and discussed in detail by Collins (4) in his monograph "An Epidemiological and Statistical Study of Tonsillitis, Including Related Throat Conditions." The Hagerstown data will be considered in greater detail in a review of the morbidity records from all sources bearing on respiratory attacks, which is in preparation.

9. DISEASES OF TEETH AND GUMS

(Int. List No., Part of 108)

TABLE 9

Disease or condition	Annual rate per 1,000							
	All ages	0-4	5-9	10-14	15-24	25-44	45-64	65 and over
Total	8.23	1.13	9.98	18.68	8.31	9.05	6.21	2.47
Abscesses	3.21	0.56	1.90	6.42	4.75	3 66	3.11	------
Toothache	2.91	0.56	5.70	10.51	2.38	2.37	------	------

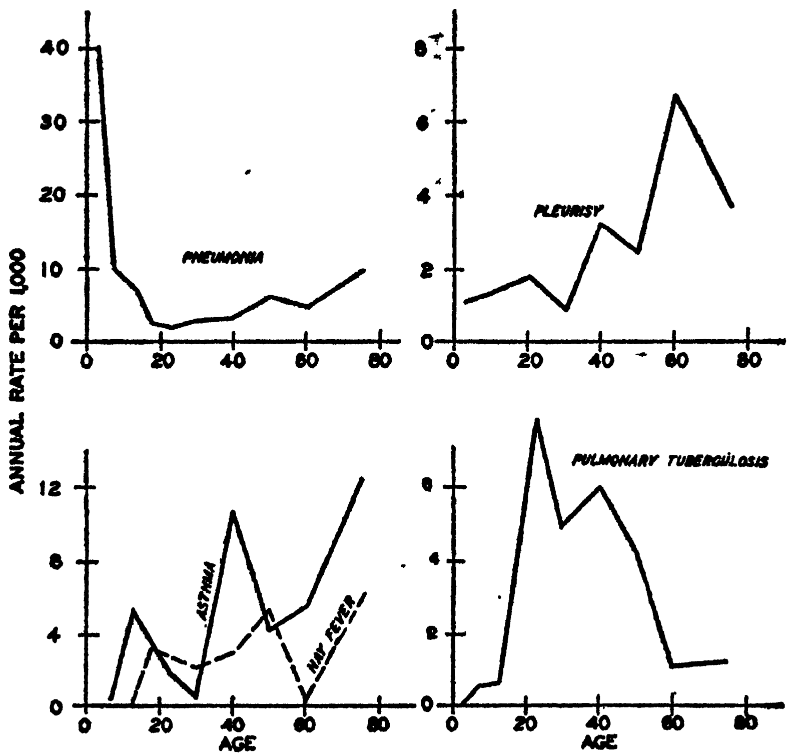

FIG. 12.—Incidence of certain respiratory diseases and conditions manifested in illness among persons of different ages in a white population group in Hagerstown, Md., December 1, 1921-March 31, 1924

This record can not, of course, be interpreted as indicating the prevalence of defective teeth and diseased gums. It indicates nothing more than the incidence of diseases and conditions that manifested themselves in abscesses and in pain severe enough to result in temporary disablement. About 60 per cent of these cases caused the patient to go to a dentist or a physician.

In so far as this record is suggestive, it indicates a relatively high incidence of dental and gum conditions in the age periods 10–14 and 15–24 after the permanent teeth have developed. This indication is also given by the larger number of records for the school ages collected by Collins (*1*) from the Hagerstown schools.

10. DISEASES AND DISORDERS OF THE DIGESTIVE SYSTEM

(Int. List Nos. 110–127; part of 108 and of 205)

TABLE 10

Disease	Annual rate per 1,000							
	All ages	0–4	5–9	10–14	15–24	25–44	45–64	65 and over
Total	102.01	158.71	148.25	130.18	61.76	71.29	109.11	101.20
Ulcers of stomach and duodenum	.73	------	------	------	.40	1.08	2.33	------
Indigestion and upset stomach and nervous indigestion	44.74	69.23	77.93	58.96	24.55	28.65	44.26	48.13
Stomach trouble and nausea	8.29	7.32	19.01	14.01	2.77	5.38	7.38	9.87
Diarrhea	13.26	58.53	7.60	9.92	6.33	8.18	8.15	7.40
Intestinal parasites	1.30	7.32	3.33	1.17	------	.22	------	------
Appendicitis	5.99	.56	4.28	7.50	12.27	5.38	6.21	------
Hernia	1.63	.56	.48	.58	.40	1.72	4.66	3.70
Constipation	.85	1.13	------	------	------	1.29	1.16	3.70
Other intestinal, including obstructions	1.51	1.13	.95	2.92	.79	.86	3.49	1.23
Biliary calculi	4.36	------	------	.55	2.38	7.97	7.77	2.47
Cholecystitis	1.94	------	.48	.58	------	1.72	6.21	3.70
Jaundice	2.72	3.94	9.98	3.50	1.98	.65	1.16	------
Other liver	1.88	.56	.95	1.17	.40	.65	6.21	7.40
"Biliousness"	10.41	4.50	20.91	27.44	8.71	4.31	8.54	11.11

Since only 58 per cent of illnesses reported as due to digestive disorders and diseases were attended by physicians, anything approaching diagnostic exactness for every case was impossible in this group. In the foregoing table, the classification has followed rather closely the terminology of the information as given, excepting cases under the following titles, nearly all of which were attended by physicians: Ulcers of stomach and duodenum, diarrhea (under 2 years of age), appendicitis, hernia, biliary calculi, cholecystitis, and jaundice. For the other cases, perhaps a very broad classification may be attempted, as follows: (*a*) Indigestion, upset stomach, nervous indigestion, stomach trouble, nausea (when not a symptom of some disorder specifically stated) which we may designate as "indigestion and upset stomach"; (*b*) "biliousness," with which may be placed "other liver conditions"; and (*c*) diarrhea. The classification is made partly on grounds that are apparent and partly by reason of similarity and dissimilarity of age curves, so that, as shown in Figure 13, diarrhea exhibits a definitely high incidence among children under 5 years of age, and thereafter does not vary greatly according to age; "indigestion and upset stomach"—some of which may have been attended by diarrhea, it is true—had a high incidence among children under 15, with its peak between 5 and 10

years; "biliousness" was less commonly reported, but was relatively frequent in the age period 5 to 9 years and was most frequent in the 10 to 14 years period. The incidence of illnesses classified under the last two headings was lowest in the young adult period, but rose gradually as age advanced.

The age curves of jaundice, appendicitis, biliary calculi, cholecystitis, and hernia have been plotted in Figure 14 and are in general accord with textbook observations. It is believed that they are

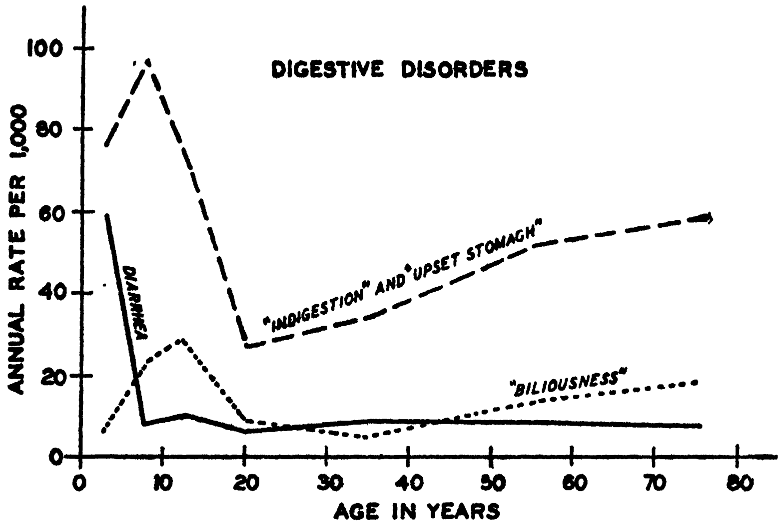

FIG. 13.—Incidence of digestive disorders manifested in illness among persons of different ages in a white population group in Hagerstown, Md., December 1, 1921-March 31, 1924

especially interesting for the reason that, so far as we are aware, they are based on a record of recognized cases (i. e., resulting in illness and attended by physicians) in a definitely enumerated general population group.

11. DISEASES OF THE KIDNEY AND ANNEXA

(Int. List Nos. 128-134)

TABLE 11

Disease or condition	Annual rate per 1,000: All ages	0-4	5-9	10-14	15-24	25-44	45-64	65 and over
Total	14.35	9.00	5.70	6.42	4.36	10.77	30.29	66.64
Nephritis	5.03	.56	.48	1.75	2.38	1.72	12.43	38.26
"Kidney trouble," unqualified	5.51	7.88	3.33	4.67	1.98	5.82	7.38	12.34
Calculi of urinary passages	.85					.65	3.11	3.70
Cystitis	1.39					.86	3.88	8.64
Other "bladder trouble"	1.45	.56	1.90			1.29	3.49	3.70

The rates in the table above, it may be emphasized, can not be interpreted as revealing the true prevalence of the diseases and conditions specified; they merely show the frequency of illnesses in which these diseases and conditions were stated to be causes during the period of the study. Of the 175 cases in which they were so recorded, 86 per cent were attended by physicians, and on approximately that proportion the attending physicians recorded the diagnoses as reported. The remaining 14 per cent consisted chiefly of cases reported as "kidney trouble."

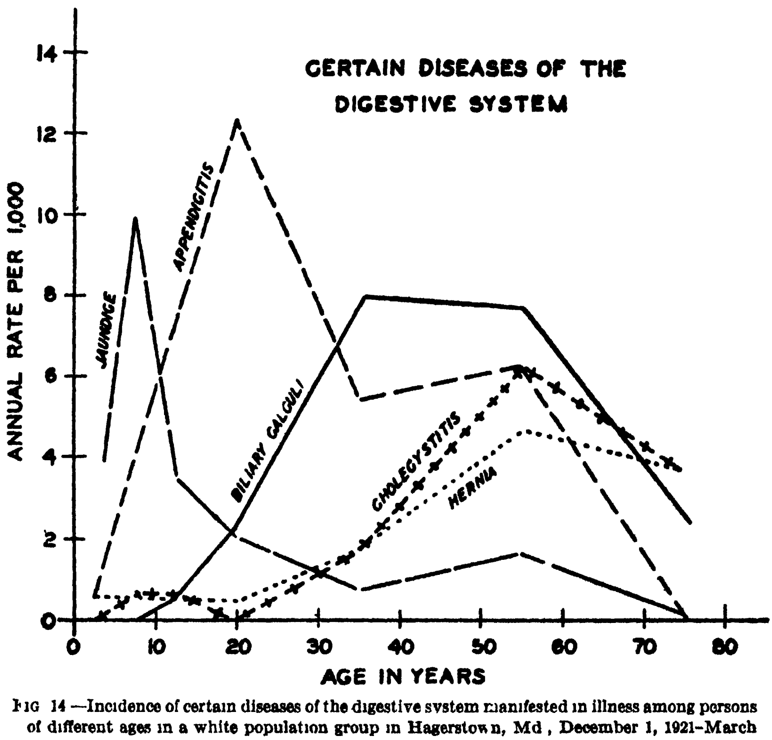

FIG 14 —Incidence of certain diseases of the digestive system manifested in illness among persons of different ages in a white population group in Hagerstown, Md , December 1, 1921–March 31, 1924

Except for some prevalence of a condition or conditions vaguely reported and diagnosed as "kidney trouble" in children and in the younger adult ages, it is quite evident that diseases and conditions in this group caused illness in middle and old age, especially in old age, to a greater extent than at younger ages.

The age curve of illness from nephritis is generally similar to that for mortality from acute nephritis and Bright's disease, but the ratio of cases to deaths decreases rapidly with age. Even if we include all illnesses from kidney conditions, such a ratio of cases to deaths would show a marked decline. Using the 1920 mortality rates for

the registration area, the ratio of the Hagerstown illnesses rate (assuming it to be representative in some degree) to the death rate declined from about 70 under 15, to 40 at 15–25, 20 at 25–44, 10 at 45–64, and 5 at 65 and over. The morbidity rates and these ratios mean nothing more, of course, than that as age advances, not only does the incidence of the disease increase but its fatality does also. Our record of cases and deaths in the population observed is too scanty and too brief to permit of any attempt to ascertain or estimate fatality rates.

12. NONVENEREAL DISEASES OF THE GENITO-URINARY SYSTEM

(Int. List Nos. 135–142)

TABLE 12

Disease or condition	Annual rate per 1,000							
	All ages	0–4	5–9	10–14	15–24	25–44	45–64	65 and over
Total [a]	13.02	1.13	1.43	8.17	17.02	21.11	17.47	7.40
Diseases of male organs [b]	1.50	2.12	1.83	1.18	.83	.46	.80	11.56
Salpingitis [c]	2.47	------	.99	------	4.53	4.84	1.51	------
Tumor and cysts of ovary and uterus [c]	2.11	------	------	------	2.26	4.44	1.51	2.15
"Menstrual trouble" [c]	6.11	------	------	13.84	15.85	5.26	4.52	------
Menopause [c]	4.81	------	------	------	------	6.05	18.09	------
Others of female genital organs [c]	8.34	------	------	1.15	9.06	18.56	7.54	2.15

[a] Rates computed on males and females. [b] Rates computed on males. [c] Rates computed on females.

The rates given above are probably based on too few cases to be in any degree typical, but they are not without interest. With the exception of 22 of the 47 cases of "menstrual troubles," practically all of the cases in this group were attended by physicians. The data represent, therefore, the prevalence of these conditions in our population to the extent that they come to the attention of physicians by reason of illness.

13. THE PUERPERAL STATE

(Int. List Nos. 143–150)

TABLE 13

Condition	Annual rate per 1,000 females			
	10–14	15–24	25–44	45–64
Total	2.31	84.55	110.98	2.26
Abortion and stillbirth	1.15	3.02	11.80	------
Confinements	------	74.73	87.17	------
Other puerperal conditions	1.15	6.79	12.51	2.26

The annual birth rate for our population was 19.6. Based on females aged 15–44, the birth rate was 65.2. The stillbirth (and abortion) ratio was 10.2 per 100 live births—an extremely high ratio when compared with records ordinarily published in vital statistics.[9] Obviously this can not be taken to indicate the occurrence of an unusual frequency of stillbirths as there was every reason to believe that the ratio for the population studied would not be higher than the average. Rather, the reason lies in the fact that we were able to secure a record of a larger proportion of stillbirths than is ordinarily reported and, in addition, a partial record of abortions. Our record is, we believe, probably not far wrong, since the field assistants made repeated visits to the same households.

14. DISEASES OF THE SKIN AND CELLULAR TISSUE

(Int List Nos. 151-154; part of 205)

TABLE 14

Disease	Annual rate per 1,000							
	All ages	0–4	5–9	10–14	15–24	25–44	45–64	65 and over
Total	19.43	39.96	40.39	33.27	10.69	10.34	7.38	14.81
Furuncle	4.66	3.38	9.03	6.42	4.75	4.31	2.33	2.47
Abscess	1.88	1.69	1.90	1.75	1.58	2.80	.78	1.23
Scabies and itch	1.45	3.38	3.80	5.84	------	------	------	------
Impetigo contagiosa	1.51	3.94	4.28	2.34	1.19	.43	------	------
"Sores" on body	4.06	15.20	10.93	8.17	.40	.43	------	------
Hives and rash	2.91	7.88	6.18	3.50	1.98	.86	1.94	1.23
Other and unqualified skin	2.97	4.50	4.28	5.25	.79	1.51	2.33	9.87

It was difficult to classify the various skin affections that were recorded except in those instances in which a physician's diagnosis was obtained. Hence the incidence of specific diseases included in the above table has probably been understated, although their variations according to age are roughly indicated. The percentages of the cases, as classified above, which were attended by physicians were as follows: Furuncle, 48 per cent; abscess, 82; impetigo, 71; scabies and itch, 52; rash, 39; hives, 47; "sores" on body, 28; other, 89; total 55. The incidence of rash, impetigo contagiosa, and "sores" was greatest among children under 10 years of age; of scabies in the age period 10–14; of furuncles and abscesses under 45 years of age, with its peak in the 5–9 age period. Some of the more specific diseases have been plotted on Figure 15.

[9] The stillbirth ratio for whites in the birth registration area was 3.8 per 100 live births in 1925 and for whites in Maryland was 5.8.

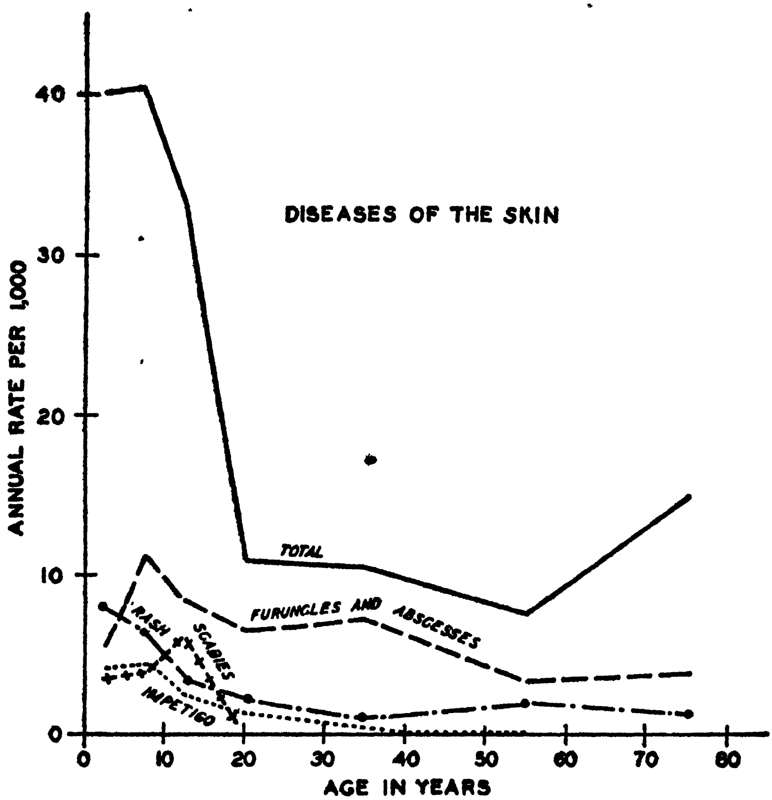

FIG. 15.—Incidence of diseases of the skin and cellular tissue manifested in illness among persons of different ages in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

15. CONGENITAL MALFORMATIONS AND EARLY INFANCY, SENILITY, AND ILL-DEFINED AND UNKNOWN CAUSES

(Int. List Nos. 159–163, 164, 205)

TABLE 15

Cause	Annual rate per 1,000							
	All ages	0–4	5–9	10–14	15–24	25–44	45–64	65 and over
Congenital malformations and "early infancy"	1.15	7.32	0.95	1.75				
Senility	.85							17.28
Ill-defined and unknown	10.29	26.45	8.55	9.34	4.36	7.73	10.48	13.68

The foregoing table requires little comment. The largest proportions of ill-defined or unknown causes of illness were, as might be expected, for young children and old persons. The senility rate of 17 is based on 14 persons, which is lower than we anticipated. However, since emphasis was laid on ascertaining the cause of every illness and

disability or the condition by which it might be described, this senility rate, plus the rate for ill-defined and unknown causes in ages over 64, represents the disability rate among persons whose chief trouble was their age.

16. EXTERNAL CAUSES

(Int. List Nos. 165-203)

TABLE 16

Cause	Annual rate per 1,000							
	All ages	0-4	5-9	10-14	15-24	25-44	45-64	65 and over
Total	39.72	28.70	45.62	43.78	32.46	32.52	55.14	46.90
Poisonings	2.78	3.38	4.75	4.67	1.58	2.80	.78	2.47
Burns	2.12	4.50	2.38	2.92	1.58	1.72	1.94	------
Cuts	3.09	3.38	5.23	7.59	3.56	2.58	3.11	1.23
Falls	4.42	2.81	2.85	5.28	1.19	3.23	6.99	12.34
Auto, street railway, etc.	3.39	2.25	3.80	1.17	3.96	3.23	5.44	1.23
Fractures, wounds, and other injuries	21.07	11.82	25.66	21.02	18.61	16.80	31.84	25.92
Other external	2.24	.56	.95	1.17	1.98	2.15	5.05	3.70

It will be noted that practically all of the disabilities resulting from external causes were accidents.

Since practically all of the accidents recorded resulted in some degree of disability, our data include the relatively more serious ones only. "Mere scratches," thumb bruised by hammers, bumps, falls without injury, and the like are not included. The age curve shown in Figure 16 indicates two periods of life in which these disabilities are most frequent—5–14 years of age and in middle age. This is in marked contrast to the usual age curve for mortality from violent causes which is higher among children under 5 years of age than in any age period until old age when it rises precipitately; the frequency of fatal accidents is thus clearly indicated to be greatest at the extremes of life.

It was not practicable to find out sufficient details about each accident to classify all under more refined headings than those given in the table, but the rates for such specific kinds of accidents as burns, cuts, falls, automobile and street-railway accidents are fairly accurate, and are plotted in Figure 17. Cuts and burns are, of course, concomitants of childhood, but they were most frequent in the age period 10–14 years. Falls were also most frequent in that age period, except in the older ages. Three ages of high incidence of automobile accidents are indicated—children 5–9, the age period 15–24, and persons of middle age (45–64), in which age group the highest incidence occurred. Although Hagerstown is a small city (30,000 population in 1922-23), the automobile and street-railway accident rate was 3.4 per 1,000 annually in the population studied.

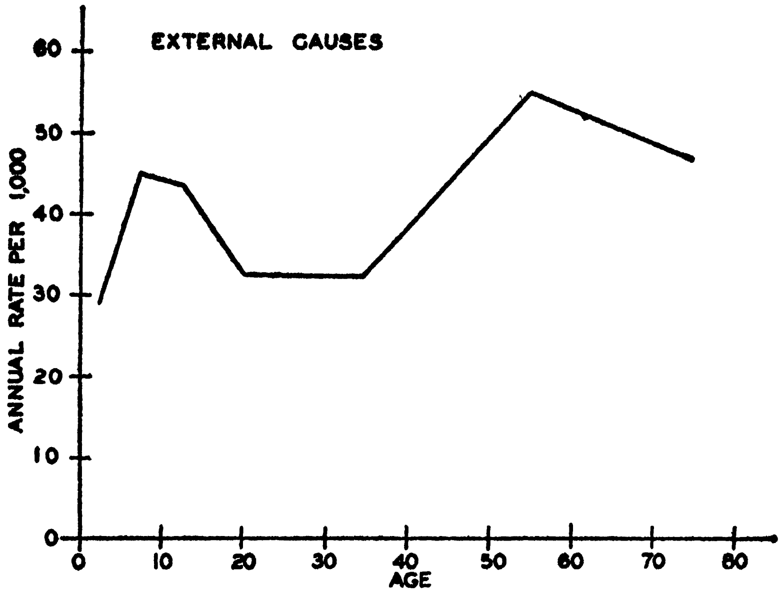

FIG 16 —Incidence of disabilities from external causes among persons of different ages in a white population group in Hagerstown, Md December 1 1921 March 31, 1924

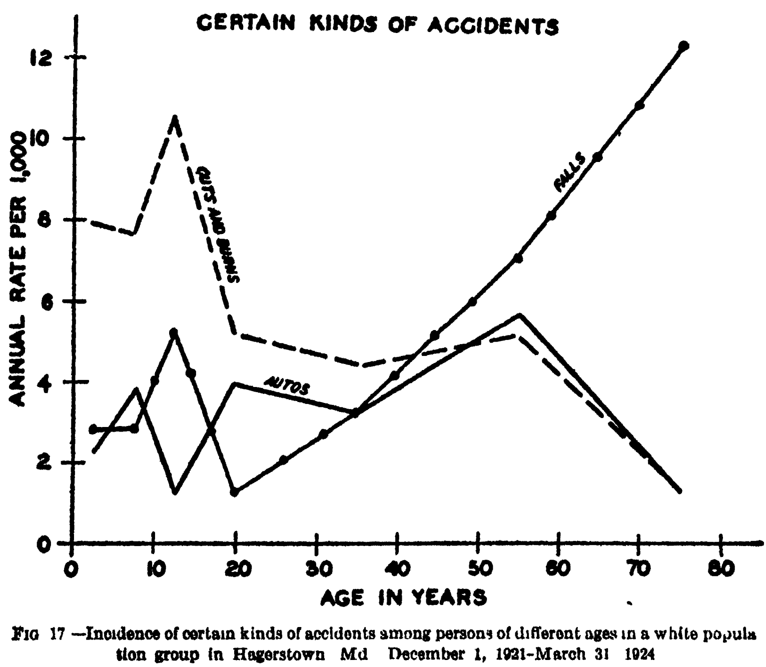

FIG 17 —Incidence of certain kinds of accidents among persons of different ages in a white population group in Hagerstown Md December 1, 1921-March 31 1924

Acknowledgments

The continuous field observations upon which the foregoing report is based were made by the following assistants: F. Ruth Phillips, Mrs. Mary King Phillips, Louise Simmons, Mrs. Clara Bell Ledford, Clarice Buhrman, and Mrs. Alcesta Owen, under the immediate supervision of Passed Asst. Surg. R. B. Norment, jr., Acting Asst. Surg. A. S. Gray, and, later, Surg. C. V. Akin.

In the analysis of the data I am especially indebted to Miss Phillips and to Associate Statistician S. D. Collins and Assistant Statistician Dorothy G. Wiehl, and other members of the statistical staff, as well as to several officers of the Public Health Service for constant advice on medical points.

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PUBLIC HEALTH ENGINEERING ABSTRACTS

Chara Fragilis and Mosquito Development. Robert Matheson and G. H. Hinman. American Journal of Hygiene, vol. 8, No. 2, March, 1928, pp. 279–292. (Abstract by L. L. Williams, jr.)

This article records observations made in central New York State from 1923 to 1927. Lake Dryden produced mosquitoes freely, whereas a spring-fed pool, cut off from the lake, did not produce mosquitoes. The pool contained much *Chara fragilis.*

For experimental purposes wooden pails were sunk in the ground, filled with rain water, and baited with dead leaves. *Culex territans* and *Anopheles punctipennis* laid eggs freely in the pails, and the resulting larvæ came through to emergence. Similar pails among the above, but containing *Chara fragilis,* showed some eggs and young larvæ, but none lived to pupate. In one such pail the *Chara* died and subsequently *Anopheles punctipennis* appeared and came through to emergence. The *Chara* apparently controlled breeding as long as it was alive.

Experiments were then conducted using known numbers of *Anopheles punctipennis, Aëdes vexans,* and *Culex pipiens* and *territans.*

Glass aquaria were stocked with earth and stream water and proved excellent rearing pools for mosquito larvæ. Similar aquaria were prepared, but with the addition of *Chara fragilis*. In the *Chara* aquaria nearly all mosquito larvæ died within two days of their introduction therein. All young larvæ died; emergences were only from the pupæ or fourth stage larvæ introduced.

At the beginning of the experiment the water was practically neutral, having a hydrogen ion concentration of pH 7. Soon after the introduction of the *Chara* it rose to pH 7.6 and fluctuated (depending on time of day) between pH 7.6 and pH 9.8. The pH value was lowest between 3 and 5 a. m., and highest between 3 and 4 p. m.

Net cages containing large numbers of larvæ of *Culex pipiens* were placed in the natural *Chara* pool. In all, about twelve hundred larvæ were so placed. Four adults emerged; all of the remaining died.

Dried *Chara fragilis*, in concentration of two to four grams per liter, had a marked effect on larval development. When young larvæ were introduced, they all died within four days. When fourth stage larvæ were introduced into the solution, a few emerged, all being undersized adults; most of them died.

If larvæ are introduced into the *Chara* pool when the pH value is at its highest, the young larvæ are almost immediately paralyzed and death is relatively quick. However, in other aquaria, if the pH value be raised high—not with *Chara*, but with *Oedogonium*—the same pH values can be obtained; but there is no effect on mosquito larvæ, all coming through to emergence. In addition, if water of high pH value be taken from the *Chara* aquaria and put in a separate jar, larvæ added thereto are not disturbed. The authors believe that there is an unstable toxic substance in *Chara*, and that the toxic action is greatest when the pH value is at its highest.

Can B. Coli be Used as an Index of the Proper Pasteurization of Milk? J. C. Swenarton. *Journal of Bacteriology* (1927), v. 13, 419–29. Abstract by W. G. Savage in *Bulletin of Hygiene*, vol. 3, No. 1, January, 1928, p. 20.

"Sixteen Pasteurizing plants were studied with respect to the *B. coli* contents of the Pasteurized milk. The Pasteurizing temperature adopted as satisfactory is 143° F. for 30 minutes with prompt cooling to 40° F. The term *B. coli* is used broadly for lactose-fermenting (with gas), nonsporing aerobes. The test was found to be very helpful in checking up the performances of the different plants.

"The author suggests the following standard: Five quantities, each of 0.1 c. c., to be examined, and of these not more than 20 per cent to show the presence of organisms of the *B. coli* group. Apparently to guard against inequalities of sampling, etc., he adds: 'Occasionally three or more of the five equal 0.1 c. c. portions constituting a single sample may show the presence of *B. coli*. This shall not be allowable if it occurs in more than (*a*) 10 per cent of the standard samples when 10 or more samples have been examined; or in (*b*) one standard sample when less than 10 samples have been examined.' This standard is a more or less arbitrary one, based on the findings from the best plants examined."

Sanitary Production of Ice Cream. R. C. Fisher. *Milk Plant Monthly*, vol 16, No. 3, March, 1927, pp. 98–104. (Abstract by Harriet S. Ryan.)

This paper, which was read at the convention of National Association of Ice Cream Manufacturers, discusses the essential factors in sanitary production of ice cream.

It is the desire of all responsible ice-cream manufacturers to make an ice cream that meets all requirements from a health and sanitary standpoint. There is, however, difference of opinion as to just what is necessary to produce a product that is safe. Some have gone to extremes in taking sanitary precautions, while others have failed to appreciate the importance of certain processes of manufacture. The bacterial content of ice cream is a more valuable measuring stick

of the Pasteurizing process and the sanitary conditions prevailing in the plant than it is in the case of milk. There is some chance for bacterial growth after milk reaches the final package, but no such conditions prevail in the manufacture of ice cream, which is kept in a frozen condition from the time it reaches the can until it is consumed.

The essentials in sanitary production, which are treated in detail in this article, may be summarized as follows: (1) Well-lighted and ventilated building; (2) simple construction of equipment for easy cleaning; (3) Pasteurizing equipment with flush and seepage-proof valves; (4) careful selection and care of ingredients; (5) Pasteurization of the entire ice-cream mix, excepting flavors and fruits, at not less than 50° F. for 30 minutes; (6) cooling and holding of milk below 40° F.; (7) thorough daily cleaning of all equipment; (8) flushing entire system with (*a*) hot water not less than 180° F., or (*b*) flush in freezers with chemical sterilizers; (9) routine bacteriological analysis of mix and ice cream, to determine the efficiency of the above processes; and (10) organization and building up of a strong working force.

Sanitary Control of the Montreal Dairy Company, Ltd. Fifth Annual Report of the Provincial Bureau of Health, Province of Quebec, Canada, 1926–1927, pp. 147-149. (Abstract by I. W. Mendelsohn.)

During the course of the typhoid fever epidemic in Montreal in the spring of 1927, the Montreal Dairy was placed under the absolute sanitary control of the Provincial Bureau of Health chemist. This control lasted from May 21 for 10 weeks, and embodied the following features: (1) Thorough disinfection of both plants of the company. The plant Pasteurizing milk and cream was disinfected twice; (2) continued and frequent examination of all employees of the plants who might come in contact with the products during or after processing or manufacture; (3) removal of all employees suspected of being infected, or who had typhoid in their families, from contact with the products of the plants; (4) maintenance of a close supervision over the raw materials entering the plants to insure that only milk or cream from sources authorized by the city food inspection division of the Montreal Department of Health enters the plants; (5) maintenance of close and constant supervision over every stage of the processing of the milk or cream, or of the manufacture of the ice cream or butter; (6) storage of butter until released upon bacteriological examination; (7) alterations and improvements effected in equipment and methods of processing better to insure the safety of the products; (8) bacteriological examination, at the plant, of the products in various stages of processing; (9) further bacteriological and chemical examinations of various products at the laboratories of the bureau.

A complete report of the epidemic is under preparation.

Refuse Collection and Disposal in Germany. Anon. *The Surveyor*, vol. 73, No. 1882, February 17, 1928, p. 237. (Abstract by H. W. Streeter.)

A review of a report by F. C. Cable, cleansing superintendent of the Westminster City Council, on his observations of methods of collecting and disposing of refuse in German towns, including Cologne, Mannheim, Frankfort, Weidenau, and Hamburg. The review deals mainly with the methods of collection observed.

At Cologne, the refuse was being disposed of by tipping on land 10 miles from the city, though a destructor, then nearing completion, was intended to burn all the refuse of the city. At this and other cities visited, the method of collection involved the use of standard dustbins, distributed to individual householders and collected, usually biweekly, by specially constructed trucks, in some cases equipped with trailers.

At Hamburg, where the Trommel-Wagen system is in operation, about 35 per cent of the refuse goes to a destructor, the remainder being tipped on land. With this system collection vehicles of a new type are used. When these wagons

arrive at the destructor, the bodies are slung off and raised up, the refuse being tipped onto the floor and eventually fed into the furnaces. The system is entirely dustless, and, as far as the design of dustbins and receiving tanks is concerned, Mr. Cable considered it the best system in operation at the time. He recommends its adoption for Westminster. In general, he considers that portions of the Continent are ahead of England so far as methods of refuse collection are concerned, but that the latter is equally ahead of the former in methods of disposal.

Garbage Collection and Disposal. R. W. Stewart. *Pacific Municipalities*, vol. 42, No. 2, February, 1928, pp. 45–48. (Abstract by F. E. DeMartini.)

Due to a lack of intelligent study of garbage handling, some cities dispose of their garbage at considerable expense. Experience of Los Angeles with chemical reduction and with disposal of garbage on a hog farm is described. A land-holding company pays $0.60 per ton for garbage f. o. b. cars Los Angeles, and $1.20 per ton for hauling the garbage to farm, and is still making a profit. Chief cost of garbage collection is caused by labor and delay necessary to enter premises to obtain the garbage. Comparison of collection methods in Los Angeles has shown that for any route within cruising radius of a team, a team is more economical than a motor truck for collecting garbage. On routes with steep grades, motor trucks are preferred. Rubbish collection and disposal are related problems. The value of rubbish lies chiefly in its content of bottles and tin cans.

The Court Rules upon an Exclusive Garbage-Removal Franchise Under an Ordinance Requiring Owner to Separate Refuse and Pay for Removal.[1] Anon. *The American City*, vol. 38, No. 1, January, 1928, p. 183. (Abstract by Harriet S. Ryan.)

A case came up in the Kansas City Court of Appeals in which the plaintiffs unsuccessfully sought to restrain the defendant from removing garbage which the plaintiff had refused to remove. They attempted to justify their refusal under a provision of the ordinance that purported to excuse them from removing garbage that had not been separated, or for persons who had not paid the required fee. The court held that this provision was void. The plaintiffs assumed a right under their franchise by taking into their own hands a method of punishment, where a legal method was provided. An ordinance permitting plaintiffs to refuse to remove garbage and to permit it to remain upon premises would defeat the purpose for which the ordinance was enacted.

Water Purification. P. H. Henderson. *Journal of the Royal Sanitary Institute*, vol. 48, No. 9, March, 1928, pp. 481–483. (Abstract by W. L. Havens.)

This article contains a brief summary of the methods used by the British Army prior to and during the World War in the provision of drinking water. Army units were provided with one of more water carts, the main tank of each cart containing 110 gallons of water. The water was pumped from the source by semirotary pumps through compressed sponge, contained in cylinders, into the main tank and thence through porcelain filter candles into a smaller tank from which the water bottles were filled. It was found that the sponges did not act as efficient clarifiers, that it was impossible to ascertain whether the filter candles were free from flaws or were allowing the passage of bacteria, and that it was difficult to secure a bacterium-proof junction between the candles and the caps of the cylinder to which they were attached. During the war, Sir William Horrocks introduced the use of aluminum sulphate as a precipitant and chlorine as a sterilizing agent. This method, however, had the following objections: (1) In the absence of perfect clarification, chlorine is deviated by the organic matter and either produces unpleasant tastes or is not available to kill the micro-organisms; (2) if excess chlorine is added the strong chlorine taste is extremely

[1] For fuller report of this decision see Public Health Reports, Oct. 21, 1927, p. 2603.

unpleasant; (3) if dechlorination is used, no chlorine is available in case subsequent accidental pollution takes place.

Polluted Water Causes Epidemic. Anon. *Illinois Health News*, vol. 14, No. 2, February, 1928, pp. 42–43. (Abstract by R. E. Tarbett.)

A short description of an outbreak of an intestinal disorder occurring in Marseilles, Ill. The outbreak involved 54 known cases, with an estimated number two to four times that. Epidemiological data implicated the public water supply, which is obtained from artesian wells flowing to a storage reservoir.

Samples of water collected the third morning after the outbreak started showed decided contamination in the water in the distribution system and slight contamination at the pumping station. Upon draining the reservoir, a hole in the bottom of the side wall adjoining a power race carrying polluted Illinois River water was found. This allowed race water to enter the reservoir when the water in the reservoir stood at a lower level than that in the race. An ice jam in the river just before the epidemic occurred had raised the level of the water in the race above normal and above the level of the water in the reservoir.

The Rôle of Ammonia in the Purification of Water. C. H. H. Harold. *Journal Royal Sanitary Institute*, vol. 48, No. 9, March, 1928, pp. 484–488. (Abstract by W. L. Havens.)

During the 1925 maneuvers of the British Army, Major Harold introduced a new method of purifying water. This method consisted in preliminary treatment with ammonia followed by sterilization with chlorine. In this way the absorption of chlorine is restrained and its germicidal powers are enhanced. The sterilizing agent is not unduly deviated by organic matter, and a safe water is produced, practically free from unpleasant tastes. The chlorine solution was given initial contact with the ammonia prior to dosing into water and the highest concentration which did not show evidence of available chlorine was fixed upon as the optimum. Two compounds were produced by the interaction of one equivalent of chlorine with one-half an equivalent of ammonia. In a foul water containing urine and nitrites in unreasonable amount some absorption of monochloramine was evident, but with all casual waters encountered, a dose of 1 p. p. m. has always sufficed. Dichloramine is slower in action, but possesses greater stability than monochloramine. Normally, each water cart having a capacity of 110 gallons is dosed with 1.25 grams of ammonium bicarbonate and about 3 grams by weight of dry chlorine gas.

New Waterworks at Merritton, Ontario. E. H. Darling. *Contract Record and Engineering Review*, vol. 41, No. 52, December 28, 1927, pp. 242–245. (Abstract by R. E. Thompson.)

The water supply of Merritton is obtained from a branch of the Welland Canal above Thorold at Lake Erie level. The turbidity at times is as high as 400 p. p. m. The original supply system consisted of an intake and a settling basin or reservoir of 3,000,000 gallons capacity, the water being delivered by gravity to the town 165 feet below. Owing to ice troubles, augmented by prevailing low water level, a new 18-inch intake, in 18 feet of water, and a pump were installed. When negotiations with neighboring municipalities for the construction of a joint filter plant had failed, it was decided to construct a filter plant, instructions being issued to this effect on February 1. The plant was put in operation in the open on April 23, i. e., in less than 12 weeks' time, the filter house being constructed later. The plant consists of mixing chamber providing 20 minutes' retention period, a coagulation basin providing 3⅜ hours' retention period, four pressure filters of 1½ m. g. d. total capacity, and chlorinating equipment. The total cost was $66,300, and of the filter equipment alone, $12,500. The old settling basin was converted into a filtered water reservoir.

DEATHS DURING WEEK ENDED APRIL 28, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended April 28, 1928, and corresponding week of 1927. (From the Weekly Health Index, May 2, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Apr. 28, 1928	Corresponding week 1927
Policies in force	71, 066, 816	67, 499, 046
Number of death claims	14, 249	13, 807
Death claims per 1,000 policies in force, annual rate	10. 5	10. 7

Deaths from all causes in certain large cities of the United States during the week ended April 28, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 2, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Apr. 28, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Apr 28, 1928 [2]
	Total deaths	Death rate [1]		Week ended Apr. 28, 1928	Corresponding week 1927	
Total (66 cities)	8, 511	14. 8	13. 5	867	832	[3] 72
Albany [4]	46	20. 0	19 6	6	2	123
Atlanta	75	15. 4	15. 5	5	8	
White	40		12. 8	3	2	
Colored	35	([5])	21. 9	2	6	
Baltimore [1]	237	14. 9	14 3	22	24	70
White	182		12. 7	15	15	60
Colored	55	([5])	23. 4	7	9	110
Birmingham	85	20 0	15. 6	13	6	111
White	36		11 4	4	5	55
Colored	49	([5])	22. 2	9	1	203
Boston	258	16. 0	16. 2	28	26	77
Bridgeport	42			7	3	128
Buffalo	165	15. 5	13. 8	21	19	90
Cambridge	35	14. 5	14. 7	4	4	71
Camden	43	16. 6	13. 7	5	5	80
Canton	28	12. 5	12 4	5	3	119
Chicago [4]	912	15. 1	12 8	95	76	81
Cincinnati	160	20 2	17 5	22	18	133
Cleveland	202	10. 5	10 3	28	27	76
Columbus	96	16 9	15. 6	7	6	65
Dallas	40	9 6	9. 6	1	5	
White	33		9 1	1	5	
Colored	7	([5])	13. 3	0	0	
Denver	101	17. 9	15. 7	9	10	
Des Moines	29	10 0	14. 0	1	4	17
Detroit	343	13. 0	13. 2	40	47	62
Duluth	35	15. 7	10 0	2	3	47
El Paso	40	17. 8	16. 5	9	5	
Erie	31			3	5	62
Fall River [4]	29	11. 3	11 0	5	5	86
Flint	33	11. 6	10 6	10	5	128
Forth Worth	32	10. 0	10. 5	4	2	
White	26		9. 1	4	2	
Colored	6	([5])	21. 3	0	0	
Grand Rapids	35	11. 1	7. 4	3	3	45
Houston	53			10	5	
White	32			6	4	
Colored	21	([5])		4	1	
Indianapolis	106	14. 5	16. 0	8	14	61
White	89		16. 0	5	12	44
Colored	17	([5])	16. 3	3	2	182
Jersey City	111	17. 9	10. 1	13	8	97
Kansas City, Kans	52	23. 0	12. 0	5	2	106
White	34		10. 8	3	2	74
Colored	18	([5])	17. 2	2	0	200
Kansas City, Mo	121	16. 2	14. 0	5	9	35
Knoxville	34	16. 9	17. 9	1	6	22
White	31		18. 0	1	4	24
Colored	3	([5])	17. 1	0	2	0

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended April 28, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 2, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Apr. 28, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Apr. 28, 1928 [2]
	Total deaths	Death rate [1]		Week ended Apr. 28, 1928	Corresponding week 1927	
Los Angeles	287			27	28	77
Lowell	19	9.0	15.6	2	6	42
Lynn	82	15.9	12.9	7	5	176
Memphis	73	20.1	18.1	3	6	35
White	36		12.2	1	1	19
Colored	37	(5)	28.8	2	5	63
Milwaukee	149	14.3	12.3	21	10	94
Minneapolis	103	11.8	11.5	8	6	48
Nashville	42	15.8	18.9	6	6	94
White	24		14.2	5	3	107
Colored	18	(5)	30.8	1	3	60
New Bedford	38	16.6	14.4	6	1	130
New Haven	56	15.6	13.3	11	3	155
New Orleans	146	17.8	18.7	18	25	87
White	80		13.1	8	12	58
Colored	66	(5)	34.5	10	13	145
New York	1,764	15.3	13.1	172	154	69
Bronx borough	230	12.6	9.2	18	15	39
Brooklyn borough	590	13.4	12.0	73	66	73
Manhattan borough	695	20.7	17.8	57	65	68
Queens borough	192	11.7	8.4	23	7	93
Richmond borough	57	19.8	21.3	6	1	108
Newark, N. J.	109	12.0	13.3	7	15	36
Oakland	60	11.4	9.8	7	2	76
Oklahoma City	33			2	2	
Omaha	52	12.2	14.3	3	6	35
Paterson	38	13.7	16.0	2	4	35
Philadelphia	590	14.9	14.2	65	57	88
Pittsburgh	214	16.7	14.9	28	20	92
Portland, Oreg.	66			3	3	32
Providence	69	12.6	10.8	6	12	52
Richmond	53	14.3	16.3	7	4	91
White	30		13.8	4	4	81
Colored	23	(5)	22.5	3	0	110
Rochester	83	13.2	12.2	4	8	32
St. Louis	270	16.6	12.7	18	13	60
St. Paul	61	12.6	12.9	3	5	29
Salt Lake City [4]	39	14.8	15.4	4	2	65
San Antonio	81	19.4	15.0	21	17	
San Diego	37	16.2	19.9	4	0	76
San Francisco	162	14.5	15.6	7	7	44
Schenectady	27	15.1	9.5	2	1	63
Seattle	76	10.4	9.6	2	9	21
Somerville	26	13.2	11.8	4	2	138
Spokane	27	12.9	15.8	1	2	26
Springfield, Mass	29	10.1	15.6	2	4	32
Syracuse	78	20.5	11.9	9	6	109
Toledo	79	13.2	13.7	7	7	67
Trenton	33	12.4	15.6	3	7	51
Washington, D. C	159	15.1	13.6	9	18	51
White	104		12.1	5	7	41
Colored	55	(5)	18.0	4	11	74
Waterbury	27			4	2	116
Wilmington, Del	27	11.0	14.0	3	1	79
Worcester	65	17.2	13.1	5	7	61
Yonkers	25	10.8	14.0	0	2	9
Youngstown	37	11.1	12.3	3	10	40

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 65 cities.
[4] Deaths for week ended Friday, Apr. 27, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 7, 1927, and May 5, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 7, 1927, and May 5, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928
New England States:								
Maine	7	3	6	5	116	52	0	0
New Hampshire		2				26		0
Vermont					215	25	0	0
Massachusetts	81	79	12	49	373	1,277	2	2
Rhode Island	3	6		1	2	296	0	0
Connecticut	22	23	4	85	51	370	1	2
Middle Atlantic States:								
New York	507	286	[1] 49	[1] 219	747	3,967	9	53
New Jersey	113	128	14	41	80	2,004	3	4
Pennsylvania	174	165			667	2,665	4	16
East North Central States:								
Ohio		67		115		930		9
Indiana	21	24	29	163	182	603	0	0
Illinois	112	83	56	136	1,354	244	10	17
Michigan	97	60	4	10	316	892	0	0
Wisconsin	20	23	60	1,257	605	82	2	2
West North Central States:								
Minnesota	28	12	2	77	147	93	4	7
Iowa	22				313		1	
Missouri	49	34		69	273	409	1	11
North Dakota	2			259	111	21	0	1
South Dakota	6	1	2	13	103	45	0	1
Nebraska	3	9		42	391	55	0	1
Kansas	8	9	7	10	1,154	236	4	1
South Atlantic States:								
Delaware	1				11	30	0	0
Maryland [2]	42	32	27	15	28	856	0	0
District of Columbia	20		2		12		0	
Virginia								
West Virginia	15	18	21	92	173	72	0	0
North Carolina	18	23			1,503	1,373	0	0
South Carolina	18	5	722	469	43	822	0	0
Georgia	9	5	156	78	200	367	0	0
Florida	12	9	16	3	86	142	0	1

[1] New York City only.
[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 7, 1927, and May 5, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928
East South Central States:								
Kentucky				14		288		0
Tennessee	11	8	86	256	90	228	1	0
Alabama	18	12	62	165	248	261	0	1
Mississippi	7	13					1	2
West South Central States:								
Arkansas	2	3	48	429	140	449	0	1
Louisiana	21	18	19	13	54	258	0	0
Oklahoma [3]	11	18	68	468	341	346	0	3
Texas		50		388		354		1
Mountain States:								
Montana	2	1			43	14	9	13
Idaho	5						1	2
Wyoming	2		3		111	22	0	0
Colorado	9	12			273	184	4	10
New Mexico	2	8	1	101	63	139	0	0
Arizona		7			46	9	0	3
Utah [2]	12	5		7	41	1	0	5
Pacific States:								
Washington	17	10			532	126	3	13
Oregon	14	7	20	21	341	71	2	0
California	119	95	33	34	2,[illegible]	120	3	4

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928
New England States:								
Maine	0	0	35	28	0	0	1	1
New Hampshire		0		16		0		0
Vermont	0	0	6	9	0	0	0	2
Massachusetts	2	2	469	292	0	0	7	3
Rhode Island	0	0	14	33	0	0	0	0
Connecticut	0	0	103	66	0	5	1	1
Middle Atlantic States:								
New York	2	2	1,133	638	6	2	21	11
New Jersey	0	1	372	251	0	8	6	2
Pennsylvania	0	0	500	482	0	1	15	17
East North Central States:								
Ohio		0		306		60		5
Indiana	0	0	141	101	105	123	1	5
Illinois	0	1	260	279	53	61	9	9
Michigan	0	0	293	230	56	12	5	0
Wisconsin	0	1	134	179	11	5	1	4
West North Central States:								
Minnesota	1	1	172	121	2	12	2	1
Iowa	0		36		5		1	
Missouri	2	0	77	100	24	52	10	4
North Dakota	0	0	32	30	0	3	1	0
South Dakota	0	0	27	36	1	8	0	0
Nebraska	0	0	34	118	6	41	1	1
Kansas	1	0	98	150	32	105	3	2
South Atlantic States:								
Delaware	0	0	9	0	0	0	2	1
Maryland [2]	0	0	71	70	0	0	5	4
District of Columbia	0		24		0		1	
Virginia								
West Virginia	0	0	31	27	47	28	7	2
North Carolina	0	0	25	23	69	59	9	6
South Carolina	2	0	7	6	17	6	15	11
Georgia	0	0	17	12	24	0	15	3
Florida	0	1	12	4	30	0	7	11

[2] Week ended Friday.

[3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 7, 1927, and May 5, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928	Week ended May 7, 1927	Week ended May 5, 1928
East South Central States:								
Kentucky	------	0	------	55	------	8	------	6
Tennessee	0	0	28	19	16	16	17	4
Alabama	0	0	11	10	27	11	17	4
Mississippi	0	0	12	9	0	9	9	2
West South Central States:								
Arkansas	1	0	7	18	2	8	11	0
Louisiana	1	0	10	8	4	11	11	18
Oklahoma [3]	0	0	27	65	53	98	10	8
Texas	------	3	------	101	------	90	------	7
Mountain States:								
Montana	0	0	111	47	8	26	1	1
Idaho	0	0	12	7	3	11	0	0
Wyoming	0	0	19	21	2	1	0	0
Colorado	0	0	167	109	0	10	33	1
New Mexico	0	0	4	25	1	4	0	0
Arizona	1	0	11	4	0	5	1	5
Utah [2]	0	0	25	2	4	14	0	0
Pacific States:								
Washington	1	0	51	43	49	35	3	4
Oregon	0	0	19	13	17	32	4	2
California	4	11	178	153	23	22	5	8

[2] Week ended Friday. [3] Exclusive of Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March, 1928										
California	22	454	167	4	1,001	2	15	765	98	32
District of Columbia	1	89	18	------	744	------	2	226	13	2
Idaho	10	4	5	------	2	------	1	149	41	5
Kansas	9	52	126	------	410	------	4	729	386	5
Montana	15	34	16	------	0	------	0	55	80	8
New Hampshire	0	17	42	------	------	------	0	93	------	0
North Carolina	1	237	------	------	14,823	------	0	126	477	12
Oklahoma [1]	12	99	2,140	71	1,694	18	5	241	859	29
Oregon	13	55	208	2	495	------	9	95	347	12
South Carolina	0	241	4,886	507	5,043	301	5	31	49	15
South Dakota	0	11	116	------	168	------	5	273	55	7
Virginia	4	153	3,073	65	3,753	23	8	233	39	22
Washington	21	54	44	------	1,205	------	3	195	203	21
Wisconsin	38	147	772	------	583	------	3	1,142	118	14

[1] Exclusive of Oklahoma City and Tulsa.

March, 1928	Cases
Actinomycosis:	
California	1
Chicken pox:	
California	3,402
District of Columbia	115
Idaho	83
Kansas	592
Montana	54
North Carolina	846
Chicken pox—Continued.	Cases
Oklahoma [1]	148
Oregon	238
South Carolina	427
South Dakota	90
Virginia	657
Washington	463
Wisconsin	1,300
Dengue:	
South Carolina	1

[1] Exclusive of Oklahoma City and Tulsa.

Disease and State	Cases
Dysentery:	
California (amoebic)	1
California (bacillary)	2
Oklahoma [1]	4
Virginia	54
German measles:	
California	2,450
Kansas	53
Montana	7
North Carolina	27
Washington	44
Hookworm disease:	
California	1
South Carolina	131
Virginia	22
Impetigo contagiosa:	
Oregon	10
Washington	18
Jaundice:	
California	2
Leprosy:	
California	1
Lethargic encephalitis:	
California	7
Kansas	1
Oregon	2
Washington	1
Wisconsin	4
Mumps:	
California	1,530
Idaho	100
Kansas	649
Montana	1
Oklahoma [1]	168
Oregon	96
South Carolina	79
South Dakota	57
Washington	449
Wisconsin	1,413
Ophthalmia neonatorum:	
Oklahoma [1]	1
South Carolina	18
Paratyphoid fever:	
California	4
Idaho	1
South Carolina	4
Pink eye:	
Kansas	7
Oklahoma [1]	2

Disease and State	Cases
Puerperal septicemia:	
Oregon	1
Rabies in animals:	
California	43
Idaho	2
South Carolina	24
Rocky Mountain spotted or tick fever:	
Montana	1
Oregon	1
Septic sore throat:	
North Carolina	11
Oklahoma [1]	10
Oregon	16
Scabies:	
Oregon	13
Washington	24
Tetanus:	
California	4
Kansas	2
Trachoma:	
California	13
Oklahoma [1]	9
South Dakota	2
Trichinosis:	
California	10
Tularaemia:	
Idaho	1
South Carolina	1
Undulant (malta) fever:	
Kansas	1
Vincent's angina:	
South Carolina	18
Whooping cough:	
California	772
District of Columbia	43
Idaho	7
Kansas	349
Montana	56
North Carolina	661
Oklahoma [1]	61
Oregon	6
South Carolina	463
South Dakota	55
Virginia	590
Washington	53
Wisconsin	495

[1] Exclusive of Oklahoma City and Tulsa.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 100 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,575,000. The estimated population of the 95 cities reporting deaths is more than 30,960,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended April 21, 1928, and April 23, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	1,431	1,776	
100 cities	829	1,065	859
Measles:			
42 States	18,550	14,628	
100 cities	8,244	4,638	
Poliomyelitis:			
44 States	19	8	
Scarlet fever:			
43 States	3,936	4,671	
100 cities	1,598	2,154	1,271
Smallpox:			
43 States	1,067	790	
100 cities	135	195	119
Typhoid fever:			
43 States	167	239	
100 cities	38	43	49
Deaths reported			
Influenza and pneumonia:			
95 cities	1,333	1,031	
Smallpox:			
95 cities	1	0	
Louisville, Ky	1	0	

City reports for week ended April 21, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	5	1	0	1	0	3	11	3
New Hampshire:									
Concord	[1] 22,546	0	0	1	0	0	1	0	3
Manchester	84,000	0	2	1	0	0	0	0	5
Vermont:									
Barre	[1] 10,008	9	0	1	0	0	0	0	0
Burlington	[1] 24,089	0	0	1	[illegible]	0	3	0	2
Massachusetts									
Boston	787,000	33	34	25	2	1	260	8	14
Fall River	131,000	2	3	1	0	0	1	0	1
Springfield	145,000	5	2	7	0	0	2	40	1
Worcester	193,000	3	4	4	0	0	58	41	7
Rhode Island:									
Pawtucket	71,000	0	1	3	0	0	19	29	7
Providence	275,000	0	8	5	0	1	264	0	6
Connecticut:									
Bridgeport	(2)	1	5	3	1	1	5	0	5
Hartford	164,000	7	5	5	0	0	30	11	8
New Haven	182,000	21	3	2	0	0	115	56	17

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended April 21, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	28	8	21		0	72	49	13
New York	5,924,000	211	246	277	94	35	1,902	30	333
Rochester	321,000	7	9	2	1	0	26	30	6
Syracuse	185,000	21	5	4		0	161	9	15
New Jersey:									
Camden	131,000	0	5	8	0	0	45	4	2
Newark	459,000	17	11	19	12	0	380	20	17
Trenton	134,000	1	3	11	0	0	4	2	4
Pennsylvania:									
Philadelphia	2,008,000	73	69	60	0	12	910	69	69
Pittsburgh	637,000	37	17	16	0	5	143	38	37
Reading	111,000	10	2		0	2	10	0	1
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	7	7	10	0	3	79	0	12
Cleveland	960,000	47	23	36	34	3	35	101	24
Columbus	285,000	12	4	1	1	0	90	3	5
Toledo	295,000	12	3	3	8	7	140	22	5
Indiana:									
Fort Wayne	99,900	3	2	4	0	0	0	0	4
Indianapolis	367,000	27	4	6	0	1	87	112	16
South Bend	81,700	2	1	0	0	0	1	0	1
Terre Haute	71,900	2	0	1	0	1	1	0	11
Illinois:									
Chicago	3,048,000	77	72	77	46	20	37	31	109
Springfield	64,700	6	1	0	2	0	0	13	1
Michigan:									
Detroit	1,290,000	48	48	28	10	7	780	25	77
Flint	136,000	15	3	4	0	2	113	54	4
Grand Rapids	156,000	1	4	2	0	3	13	8	3
Wisconsin:									
Kenosha	52,700	17	1	0	2	0	2	0	1
Milwaukee	517,000	71	13	8	48	3	4	39	20
Racine	69,400	5	2	1	0	0	1	2	2
Superior	[1] 39,671	0	0	0	0	0	0	0	3
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	6	1	0	18	4	1	2	3
Minneapolis	434,000	56	14	10	0	11	83	206	15
St. Paul	248,000	20	12	2	0	0	3	30	13
Iowa:									
Davenport	[1] 52,469	1	1	0	0		0	0	
Des Moines	146,000	0	2	1	0		0	0	
Sioux City	78,000		1						
Waterloo	36,900	11	0	0	0		3	4	
Missouri:									
Kansas City	375,000	13	5	0	0	1	51	79	12
St. Joseph	78,400	1	1	0	0	0	0	11	8
St. Louis	830,000	12	39	27	2	1	351	15	
North Dakota:									
Fargo	[1] 26,403	1	0	0	0	0	0	1	2
Grand Forks	[1] 14,811	2	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	6	0	0	0		1	0	
Sioux Falls	[1] 30,127	0	0	1	0		0	0	
Nebraska:									
Lincoln	62,000	4	1	2	0	0	0	22	0
Omaha	216,000	8	2	1	0	0	2	1	14
Kansas:									
Topeka	56,500	22	1	0	0	3	1	4	3
Wichita	92,500	18	1	1	0	0	11	0	6

[1] Estimated July 1, 1925.

City reports for week ended April 21, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	1	2	1	0	0	9	2	3
Maryland:									
Baltimore	808,000	90	25	21	10	1	738	35	41
Cumberland	[1] 33,741	2	0	1	1	0	0	0	0
Frederick	[1] 12,035	0	0	1	0	0	30	0	0
District of Columbia:									
Washington	528,000	12	12	11	3	2	190	0	21
Virginia:									
Lynchburg	30,500	3	1	2	0	0	39	1	4
Norfolk	174,000	10	1	1	0	0	62	6	3
Richmond	189,000	13	1	1	0	0	135	3	4
Roanoke	61,900	7	0	0	0	0	18	1	1
West Virginia:									
Charleston	50,700	3	1	1	0	0	0	0	1
Wheeling	[1] 56,208	10	1	0	0	0	6	0	3
North Carolina:									
Raleigh	[1] 30,371	1	0	2	0	1	49	0	1
Wilmington	37,700	0	0	0	0	1	1	0	6
Winston-Salem	71,800	10	0	1	0	0	24	18	0
South Carolina:									
Charleston	74,100	1	0	0	14	0	0	0	2
Columbia	41,800	9	0	0	0	0	2	16	0
Greenville	[1] 27,311	0	1	0	0	0	0	1	2
Georgia:									
Atlanta	(2)	13	1	4	17	4	21	7	6
Brunswick	[1] 16,809	0	0	0	0	0	10	0	0
Savannah	94,900	1	0	0	3	0	2	1	3
Florida:									
Miami	[1] 69,754	14	1	2	4	0	6	19	2
St. Petersburg	[1] 26,847		0			0			1
Tampa	102,000	3	1	0	0	0	9	6	2
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	1	1	1	0	0	2	0	10
Louisville	311,000	1	3	1	2	1	97	3	14
Tennessee:									
Memphis	177,000	18	3	1	0	5	42	26	10
Nashville	137,000	4	0	1	0	3	41	8	3
Alabama:									
Birmingham	211,000	13	1	2	50	3	119	7	7
Mobile	66,800	0	0	1	1	1	1	0	1
Montgomery	47,000	5	0	1	3		6	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	2	1	0	0		0	1	
Little Rock	75,900	3	1	2	0	0	6	2	5
Louisiana:									
New Orleans	419,000	5	7	16	6	4	1	0	17
Shreveport	59,500	0	1	0	0	0	29	0	4
Oklahoma:									
Oklahoma City	(2)	6	1	0	19	2	14	4	5
Tulsa	133,000	14	1	0	0		4	18	
Texas:									
Dallas	203,000	14	4	6	2	2	4	0	5
Fort Worth	159,000	7	1	5	1	0	9	3	4
Galveston	49,100	0	0	1	0	0	3	0	2
Houston	[1] 164,954	0	2	2	0	0	40	0	5
San Antonio	205,000	0	1	4	0	5	12	1	10
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	0
Great Falls	[1] 29,883	10	1	0	0	0	2	0	0
Helena	[1] 12,037	0	0	0	0	0	9	0	0
Missoula	[1] 12,668	0	1	0	0	0	0	0	2

[1] Estimated July 1, 1925. [2] No estimate made.

City reports for week ended April 21, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
MOUNTAIN—continued									
Idaho:									
Boise	[1] 23,042	0	0	0	0	0	0	1	0
Colorado:									
Denver	285,000	66	10	5		6	74	121	4
Pueblo	43,900	20	1	1	0	0	9	0	2
New Mexico:									
Albuquerque	[1] 21,000	12	1	0	0	0	20	1	0
Utah:									
Salt Lake City	133,000	16	3	3	0	0	1	0	3
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	([2])	35	4	1	0		82	8	
Spokane	109,000	0	2	2	0		0	0	
Tacoma	106,000	10	1	3	0	0	4	70	2
Oregon:									
Portland	282,383	25	2	7	0	0	19	5	7
California:									
Los Angeles	([2])	90	40	28	18	1	36	56	20
Sacramento	73,400	1	2	0	3	3	2	5	2
San Francisco	567,000	80	20	6	2	0	30	60	0

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	4	0	0	0	1	0	1	0	9	25
New Hampshire:											
Concord	0	0	0	0	0	3	0	0	0	0	13
Manchester	3	5	0	0	0	3	0	0	0	0	33
Vermont:											
Barre	0	1	0	0	0	0	0	0	0	0	2
Burlington	1	0	0	0	0	0	0	0	0	0	10
Massachusetts:											
Boston	66	47	0	0	0	9	1	0	0	37	258
Fall River	3	8	0	0	0	3	1	1	0	0	24
Springfield	5	12	0	0	0	0	0	0	0	7	35
Worcester	9	4	0	0	0	3	0	0	0	9	76
Rhode Island:											
Pawtucket	1	1	0	0	0	3	0	0	0	1	24
Providence	8	30	0	0	0	1	0	0	0	2	78
Connecticut:											
Bridgeport	17	1	0	0	0	1	0	0	0	11	33
Hartford	4	6	0	0	0	1	0	1	0	3	44
New Haven	9	1	0	0	0	2	0	0	0	26	73
MIDDLE ATLANTIC											
New York:											
Buffalo	22	30	0	0	0	8	0	0	0	23	141
New York	270	345	0	0	0	130	9	9	1	148	1,856
Rochester	15	10	0	0	0	4	1	0	0	7	91
Syracuse	11	12	0	0	0	2	1	0	0	22	73
New Jersey:											
Camden	7	4	0	0	0	1	0	0	0	4	24
Newark	29	29	0	1	0	13	1	1	0	24	143
Trenton	4	2	1	0	0	0	0	1	0	0	30

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended April 21, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
MIDDLE ATLANTIC—continued											
Pennsylvania:											
Philadelphia	96	109	0	0	0	43	3	2	1	91	609
Pittsburgh	28	24	0	0	0	9	1	0	0	34	213
Reading	3	24	0	0	0	0	0	0	0	2	24
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	22	29	2	0	0	13	1	0	0	7	149
Cleveland	36	23	0	0	0	16	0	0	0	55	214
Columbus	9	13	1	0	0	6	0	1	0	1	83
Toledo	14	3	3	0	0	2	1	0	0	17	71
Indiana:											
Fort Wayne	5	0	3	5	0	1	0	0	0	0	31
Indianapolis	9	7	9	9	0	9	0	1	0	7	94
South Bend	4	0	0	1	0	0	0	0	0	1	12
Terre Haute	2	0	0	4	0	2	0	0	0	1	29
Illinois:											
Chicago	115	120	2	1	0	67	2	1	0	102	854
Springfield	2	17	1	13	0	0	1	0	0	1	17
Michigan:											
Detroit	87	128	2	2	0	24	2	1	0	87	373
Flint	6	19	1	11	0	0	0	0	0	4	27
Grand Rapids	7	3	2	0	0	1	0	0	0	3	50
Wisconsin:											
Kenosha	2	2	1	1	0	0	0	0	0	0	4
Milwaukee	27	40	2	1	0	6	1	1	1	14	148
Racine	4	1	1	0	0	0	1	0	0	5	16
Superior	2	13	1	0	0	1	0	0	0	0	10
WEST NORTH CENTRAL											
Minnesota:											
Duluth	7	6	0	0	0	4	0	0	0	2	27
Minneapolis	48	39	6	0	0	4	1	0	0	7	132
St. Paul	27	19	3	0	0	3	1	0	0	27	71
Iowa:											
Davenport	2	4	4	0	------	------	0	0	------	0	------
Des Moines	6	9	1	10	------	------	0	0	------	0	------
Sioux City	2	------	2	------	------	------	0	------	------	------	------
Waterloo	1	2	0	0	------	------	0	0	------	0	------
Missouri:											
Kansas City	12	37	2	3	0	11	0	0	0	14	113
St. Joseph	3	0	0	1	0	4	0	0	0	0	31
St. Louis	36	24	4	3	0	15	1	3	0	32	234
North Dakota:											
Fargo	2	6	0	0	0	1	0	0	1	6	9
Grand Forks	0	2	0	0	------	------	0	0	------	0	------
South Dakota:											
Aberdeen	2	2	0	0	------	------	0	0	------	1	------
Sioux Falls	1	1	0	0	------	------	0	0	------	0	------
Nebraska:											
Lincoln	0	3	0	3	0	0	0	0	0	4	14
Omaha	2	8	9	4	0	2	0	0	0	2	63
Kansas:											
Topeka	3	5	1	12	0	2	0	0	0	10	19
Wichita	3	2	1	8	0	0	0	0	0	8	25
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	1	0	0	0	0	0	1	0	3	28
Maryland:											
Baltimore	34	30	0	0	0	20	2	2	0	64	256
Cumberland	1	0	0	0	0	0	0	0	0	0	14
Frederick	0	0	0	0	0	0	0	0	0	0	5
District of Columbia:											
Washington	23	30	1	0	0	14	1	1	0	6	154

City reports for week ended April 21, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
Virginia:											
Lynchburg	1	0	0	0	0	1	0	0	0	11	18
Norfolk	3	7	1	1	0	0	0	0	0	0	0
Richmond	2	5	1	0	0	10	0	0	0	0	63
Roanoke	1	0	0	0	0	0	0	0	0	0	14
West Virginia:											
Charleston	0	2	1	0	0	3	0	0	0	0	17
Wheeling	1	3	0	0	0	0	1	0	0	0	15
North Carolina:											
Raleigh	0	0	0	0	0	1	0	0	0	7	18
Wilmington	0	1	0	1	0	0	0	0	0	5	19
Winston-Salem	1	1	5	0	0	1	0	0	0	0	19
South Carolina:											
Charleston	0	0	1	1	0	2	0	0	0	1	21
Columbia	0	1	1	0	0	1	0	0	0	2	4
Greenville	1	2	1	0	0	2	0	0	0	1	13
Georgia:											
Atlanta	4	14	5	2	0	4	0	1	0	1	83
Brunswick	0	0	0	0	0	0	1	0	0	0	4
Savannah	0	0	1	2	0	2	1	0	0	0	19
Florida:											
Miami	1	2	2	0	0	0	1	1	0	3	26
St. Petersburg	0	-------	0	-------	0	0	0	-------	0	-------	12
Tampa	1	0	1	0	0	5	0	0	0	0	63
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	5	0	1	0	4	1	0	0	1	36
Louisville	8	24	1	1	1	2	1	0	0	1	68
Tennessee:											
Memphis	5	6	3	0	0	8	0	0	0	1	91
Nashville	2	0	0	0	0	8	0	1	0	2	75
Alabama:											
Birmingham	1	2	2	1	0	4	1	2	0	9	69
Mobile	0	3	1	1	0	2	0	0	0	0	27
Montgomery	0	0	1	0	-------	-------	1	0	-------	0	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	0	0	0	-------	-------	0	0	-------	0	-------
Little Rock	0	14	1	0	0	5	0	0	0	0	0
Louisiana:											
New Orleans	5	4	1	0	0	11	2	3	1	4	162
Shreveport	1	0	1	0	0	2	0	0	1	0	34
Oklahoma:											
Oklahoma City	1	8	3	12	0	2	0	0	0	0	84
Tulsa	2	13	1	7	-------	-------	0	0	-------	4	-------
Texas:											
Dallas	2	19	8	1	0	4	1	0	0	17	51
Fort Worth	1	13	4	10	0	0	0	0	0	0	38
Galveston	1	0	0	0	0	1	1	1	1	0	23
Houston	0	3	1	0	0	3	0	0	0	0	71
San Antonio	0	1	0	1	0	13	0	1	0	0	80
MOUNTAIN											
Montana:											
Billings	1	0	0	0	0	0	0	0	0	3	5
Great Falls	2	0	1	0	0	0	0	0	0	0	7
Helena	0	4	0	1	0	0	0	0	0	0	10
Missoula	1	2	1	0	0	0	0	0	0	0	6
Idaho:											
Boise	2	2	1	0	0	0	1	0	0	0	5
Colorado:											
Denver	10	9	1	1	0	6	0	0	0	30	83
Pueblo	2	5	1	0	0	0	0	0	0	0	11
New Mexico:											
Albuquerque	0	2	0	0	0	8	0	1	0	0	18

City reports for week ended April 21, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
MOUNTAIN—con.											
Utah:											
Salt Lake City	1	2	1	10	0	1	1	0	0	9	39
Nevada:											
Reno	0	0	0	1	0	0	0	0	0	0	4
PACIFIC											
Washington:											
Seattle	8	2	2	1			1	0		4	
Spokane	4	7	5	20			0	0		0	
Tacoma	2	0	4	2	0	1	0	0	0	1	26
Oregon:											
Portland	8	2	6	34	0	1	0	0	0	0	69
California:											
Los Angeles	22	28	5	0	0	26	1	1	0	45	270
Sacramento	1	1	0	0	0	3	1	0	0	1	28
San Francisco	16	21	2	0	0	12	1	0	1	21	144

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	2	1	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	35	18	5	3	0	0	1	0	1
Rochester	0	0	1	0	0	0	0	0	0
New Jersey:									
Newark	1	2	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	2	1	0	0	0	0	0	0	0
Pittsburgh	2	2	0	1	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	4	1	0	0	0	0	0	0	0
Columbus	0	0	1	1	0	0	0	0	0
Indiana:									
Indianapolis	0	1	0	0	0	0	0	0	0
South Bend	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago	9	3	0	0	0	0	0	0	0
Michigan:									
Detroit	0	2	0	1	0	0	0	1	0
Wisconsin:									
Milwaukee	4	2	1	0	0	0	0	0	0
Superior	2	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	1	0	0	0	0	0	0	0	0
Missouri:									
Kansas City	5	2	0	0	0	0	0	0	0
St. Louis	3	0	0	0	0	0	0	0	0

City reports for week ended April 21, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	0	1	0	0	0	0	0
North Carolina:									
Raleigh	0	0	0	0	0	1	0	0	0
Wilmington	0	0	0	0	0	1	0	0	0
South Carolina:									
Charleston	0	0	0	0	1	1	0	0	0
Greenville	0	0	0	0	0	1	0	0	0
Georgia:									
Savannah	0	0	0	0	1	1	0	0	0
Florida:									
Miami	0	0	0	0	2	0	0	0	0
Tampa	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Nashville	0	0	1	0	1	1	0	0	0
Alabama:									
Birmingham	2	2	0	0	0	0	0	0	0
Mobile	0	0	0	1	2	0	0	0	0
Montgomery	0	0	0	0	2	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	1	0	0	0	0	0	0	0	0
Oklahoma:									
Oklahoma City	0	1	0	0	1	0	0	0	0
Texas:									
Dallas	0	0	0	0	1	0	0	0	0
Houston	0	1	0	1	0	0	0	1	1
MOUNTAIN									
Colorado:									
Denver	2	0	0	1	0	0	0	0	0
Utah:									
Salt Lake City	1	0	0	0	0	0	0	0	0
Washington:									
Seattle	1	0	0	0	0	0	0	1	0
Tacoma	0	0	0	0	0	0	0	1	0
Oregon:									
Portland	0	0	0	2	0	0	0	0	0
California:									
Los Angeles	3	1	1	1	0	0	1	0	0
Sacramento	0	1	0	0	0	0	0	0	0

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended April 21, 1928, compared with those for a like period ended April 23, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, March 18 to April 21, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928	Apr. 23, 1927	Apr. 21, 1928
101 cities	178	158	190	139	200	132	174	144	179	[2] 137
New England	130	124	137	110	181	126	105	168	135	131
Middle Atlantic	226	222	263	181	269	188	271	209	270	204
East North Central	178	148	159	146	169	121	135	116	131	116
West North Central	121	132	158	84	170	101	109	101	141	[2] 82
South Atlantic	146	112	157	121	117	88	141	82	135	82
East South Central	41	60	61	85	66	25	86	40	30	40
West South Central	174	116	178	108	335	132	141	160	124	124
Mountain	81	80	108	115	170	44	108	133	188	80
Pacific	193	105	170	74	125	77	115	74	157	102

MEASLES CASE RATES

101 cities	943	1,326	837	1,388	867	1,277	766	1,340	788	[2] 1,365
New England	198	1,536	205	2,014	270	1,874	223	1,726	295	1,743
Middle Atlantic	114	1,393	127	1,491	159	1,504	172	1,739	145	1,824
East North Central	1,138	1,009	925	1,023	957	1,034	885	998	797	817
West North Central	1,514	725	1,821	748	1,300	762	1,314	861	1,552	[2] 1,016
South Atlantic	972	2,893	1,091	2,905	996	2,285	1,311	2,115	1,589	2,358
East South Central	436	1,426	284	1,696	608	958	396	1,117	517	1,538
West South Central	1,754	1,120	935	836	2,114	436	1,005	428	1,249	380
Mountain	5,074	504	3,443	752	2,788	708	2,080	743	1,793	761
Pacific	3,163	807	2,761	560	3,051	447	2,207	524	2,103	393

SCARLET FEVER CASE RATES

101 cities	423	309	440	303	394	273	391	226	362	[2] 265
New England	479	411	530	405	367	331	423	301	346	264
Middle Atlantic	580	374	612	398	594	366	581	273	528	287
East North Central	347	306	329	266	272	252	285	194	298	272
West North Central	400	292	467	257	433	263	396	277	342	[2] 297
South Atlantic	179	224	197	221	177	179	150	154	161	179
East South Central	162	234	172	204	177	100	218	234	167	209
West South Central	58	124	54	144	99	148	50	128	41	164
Mountain	1,130	177	1,210	186	941	239	950	239	932	212
Pacific	360	202	340	207	243	133	243	123	209	151

SMALLPOX CASE RATES

101 cities	30	25	28	25	26	18	24	20	33	[2] 22
New England	0	0	2	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	29	18	33	24	37	24	32	24	29	31
West North Central	69	125	30	64	42	84	55	49	40	[2] 63
South Atlantic	41	23	61	68	25	14	27	11	65	12
East South Central	106	25	122	30	86	10	96	35	162	20
West South Central	74	36	62	36	108	4	87	16	95	8
Mountain	18	62	9	142	27	106	27	150	54	168
Pacific	99	61	68	23	55	18	26	74	97	59

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.

[2] Sioux City, Iowa, not included.

Summary of weekly reports from cities, March 18 to April 21, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928	Apr. 23, 1927	Apr. 21, 1928
101 cities	8	4	8	5	8	4	8	5	7	[2] 6
New England	5	9	12	5	7	2	9	9	0	7
Middle Atlantic	7	4	6	4	6	1	5	5	7	6
East North Central	4	3	1	2	5	3	1	1	8	3
West North Central	4	0	2	2	2	6	12	8	4	[2] 6
South Atlantic	13	11	16	21	9	12	13	4	11	9
East South Central	41	5	20	10	35	15	35	20	30	15
West South Central	29	8	25	12	37	16	17	20	12	20
Mountain	0	0	0	0	0	0	9	0	27	0
Pacific	10	5	24	3	8	8	18	3	10	3

INFLUENZA DEATH RATES

	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928	Apr. 23, 1927	Apr. 21, 1928
95 cities	27	32	22	29	23	34	21	30	18	28
New England	7	9	12	11	7	16	16	9	12	7
Middle Atlantic	26	22	21	29	26	31	21	27	29	26
East North Central	16	35	15	24	9	40	11	27	11	28
West North Central	14	16	4	18	17	16	12	24	21	41
South Atlantic	65	39	38	21	40	19	38	30	22	16
East South Central	96	89	106	78	74	73	90	84	58	68
West South Central	25	98	30	86	51	107	42	90	36	45
Mountain	27	133	27	53	36	80	18	53	0	53
Pacific	28	7	24	14	17	7	14	14	10	14

PNEUMONIA DEATH RATES

	Mar. 26, 1927	Mar. 24, 1928	Apr. 2, 1927	Mar. 31, 1928	Apr. 9, 1927	Apr. 7, 1928	Apr. 16, 1927	Apr. 14, 1928	Apr. 23, 1927	Apr. 21, 1928
95 cities	167	213	163	222	162	215	153	207	159	198
New England	156	182	156	225	140	179	156	177	151	166
Middle Atlantic	198	245	186	264	198	244	175	243	199	242
East North Central	141	211	147	207	131	241	141	199	135	192
West North Central	101	118	93	130	187	122	128	175	124	155
South Atlantic	218	240	225	230	150	179	184	209	179	181
East South Central	197	240	133	286	218	397	138	183	166	235
West South Central	136	275	161	242	140	185	76	236	81	197
Mountain	170	166	161	106	242	97	152	186	161	106
Pacific	110	101	126	118	117	105	117	88	97	81

[2] Sioux City, Iowa, not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1927	1928	1927	1928
Total	101	95	31,050,300	31,657,000	30,369,500	30,968,700
New England	12	12	2,242,700	2,274,400	2,242,700	2,274,400
Middle Atlantic	10	10	10,594,700	10,732,400	10,594,700	10,732,400
East North Central	16	16	7,820,700	7,991,400	7,820,700	7,991,400
West North Central	12	10	2,634,500	2,683,500	2,518,500	2,566,400
South Atlantic	21	21	2,890,700	2,961,900	2,890,700	2,961,900
East South Central	7	6	1,028,300	1,048,300	980,700	1,000,100
West South Central	8	7	1,260,700	1,307,600	1,227,800	1,274,100
Mountain	9	9	581,600	591,100	581,600	591,100
Pacific	6	4	1,996,400	2,046,400	1,512,100	1,548,900

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended April 7, 1928.—The following report for the week ended April 7, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Suez.
Aden Protectorate.—Aden.
India.—Bassein, Bombay, Calcutta, Rangoon.

CHOLERA

India.—Bassein, Calcutta, Madras, Rangoon, Tuticorin.
French India.—Pondicherry.
Siam.—Bangkok.
French Indo-China.—Saigon.

India.—Bombay, Calcutta, Madras, Moulmein, Rangoon.
French India.—Pondicherry.
China.—Shanghai, Hong Kong.
Japan.—Shimonoseki.
Kwantung.—Dairen.

Returns for the week ended April 7 were not received from the following ports:

Ceylon.—Colombo.
China.—Canton.
Dutch East Indies.—Banjermasin, Belawan-Deli, Menado, Samarinda.
Iraq.—Basra.
Union of Soviet Socialist Republics.—Vladivostok.

ANGOLA

Communicable diseases—December, 1927—January, 1928.—During December, 1927, and January, 1928, communicable diseases were reported in Angola as follows:

Disease	December, 1927				January, 1928			
	Coast district	Land frontier	Interior	Total	Coast district	Land frontier	Interior	Total
Ancylostomiasis	5	5	7	17	10	17		27
Beriberi	6	4		10	2			2
Bilharzia	5		6	11	2	5	31	38
Chicken pox [1]	19		4	23	13	1	1	15
Dysentery	36	20	12	68	27	21	9	57
Erysipelas	2			2				
Hemoglobin fever	11	2	9	22	10	2	5	17
Influenza	58	189	98	345	44	353	69	466
Leprosy	4	1		5				
Malaria	353	167	165	685	359	212	104	675
Measles	116		4	120	60	6	4	70
Meningitis			14	14		1		1
Mumps	4	1		5	2			2
Plague	3			3				
Puerperal septicemia	1			1	1	1		2
Pneumonia	11	3	15	29	25	12	7	44
Relapsing fever		4		4		14		14
Ringworm						4		4
Scabies	9	75		84	6	50		56
Smallpox	7			7	10			10
Tetanus	1			1	3			3
Tuberculosis	39	3	3	45	27	4	3	34
Typhoid fever	1	2	1	4	2			2
Trypanosomiasis	57	27	38	122	74	70	7	151
Venereal diseases	152	216	16	384	178	237	27	442
Whooping cough	7			7			2	2
Yaws	89	33	69	191	82	19	5	106

[1] Including alastrim.

ARABIA

Aden—Plague.—Under date of April 1, 1928, continued prevalence of plague was reported at Aden, with a total of 1,170 cases and 830 deaths from the outbreak of the epidemic. It was stated that the epidemic had spread to a point 25 miles north of Aden.

CANADA

Fort William, Ontario—Vital statistics and communicable diseases, 1927.—The annual report of the department of health of the city of Fort William, Ontario, Canada, for the year ended October 31, 1927, gives the following statistics:

Population (estimated)	23,544	Death rate per 1,000 births	54.63
Births	604	Deaths (all causes)	[1] 196
Stillbirths	25	Death rate per 1,000 population	[1] 8.32
Deaths under 1 year	33		

[1] Including nonresidents.

Communicable diseases—Cases and deaths at Fort William, Ontario, Canada, year ended October 31, 1927

Disease	Cases	Deaths	Disease	Cases	Deaths
Broncho-pneumonia	8	6	Pneumonia (lobar)		15
Chicken pox	66		Poliomyelitis	1	
Diphtheria	27	2	Scarlet fever	32	
Erysipelas	3		Smallpox	0	
Gonorrhea	51		Syphilis	22	
Influenza	3	1	Tuberculosis	24	12
Measles	32	1	Typhoid fever	10	
Mumps	5		Whooping cough	69	3

Quebec Province—Communicable diseases—Week ended April 21, 1928.—The Bureau of Health of the Province of Quebec reports cases of communicable diseases for the week ended April 21, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	67	Scarlet fever	95
Diphtheria	36	Smallpox	25
German measles	12	Tuberculosis	51
Influenza	6	Typhoid fever	15
Measles	302	Whooping cough	12

ITALY

Messina—Vital statistics—Year 1927.—The following table gives vital statistics for the city of Messina, Italy, for the year 1927:

Population	197,866	Deaths from—Continued.	
Births	4,843	Influenza	86
Still-born	125	Measles	1
Deaths	3,049	Smallpox	1
Deaths from—		Tuberculosis	162
Cerebrospinal meningitis	14	Typhoid fever	27
Diphtheria	19		

MALTA

Communicable diseases—March, 1928.—During the month of March, 1928, communicable diseases were reported in the Island of Malta, as follows:

Disease	Cases	Disease	Cases
Bronchopneumonia	19	Pneumonia	8
Cerebrospinal meningitis	1	Puerperal fever	3
Chicken pox	36	Scarlet fever	6
Diphtheria	4	Trachoma	41
Erysipelas	6	Tuberculosis	28
Influenza	28	Typhoid fever	20
Malta (undulant) fever	46	Whooping cough	6
Malaria [1]	1		

[1] Contracted abroad.

Population, civil, estimated: 228,575.

NIGERIA

Lagos—Plague—Plague-infected rats—February 26–March 3, 1928.—During the week ended March 3, 1928, two cases of plague with two deaths were reported at the port of Lagos, Nigeria. During the same period, of 8,246 rats taken in Lagos, 1,186 were examined, 51 per cent of these being found infected.

Inland localities—Smallpox.—During the same period, 103 cases of smallpox were reported, with 7 deaths, in 12 inland localities of the northern provinces of Nigeria, with high mortality reported at Mokwa. In the southern provinces 7 cases were reported from 3 localities.

Other transmissible diseases.—Ten cases of relapsing fever and 72 cases of trypanosomiasis were reported in the northern provinces of Nigeria.

PORTO RICO

Smallpox—Correction.—The unofficial report of smallpox in the vicinity of Fajardo, Porto Rico, which was published in the Public Health Reports dated March 23, 1928, page 723, was erroneous. The Commissioner of Health of Porto Rico states that smallpox has not been reported there for several years.

UNION OF SOUTH AFRICA

Orange Free State—Plague—Weeks ended March 10 and 17, 1928.—During the two weeks ended March 10 and 17, 1928, three fatal cases of plague were reported on Allemanskamp farm, Theunissen Area of the Winburg District, Orange Free State. A further suspect case, in a native, was reported found on the Theunissen-Theron Road. The case ended fatally.

Smallpox.—A fresh outbreak of smallpox was reported during the week ended March 10, 1928, in the State of Natal.

Typhus fever.—During the week ended March 10, 1928, fresh outbreaks of typhus fever were reported in the Orange Free State, occurring in Harrismith district, and two sporadic cases in Europeans, one of which was imported, in Durban, Natal.

During the week ended March 17, 1928, fresh outbreaks were reported in the Cape Province, occurring in four districts; in Natal, at Port Shepstone; and in the Transvaal, in Potchefstroom district, on a farm.

Month of February, 1928—Typhus fever.—During the month of February, 1928, 65 cases of typhus with 9 deaths were reported in the native population of the Union of South Africa. The distribution of the occurrence was as follows: Cape Province—cases 36, deaths 6; Natal—cases 6, deaths 1; Orange Free State—cases 23, deaths 2. There were reported two cases in Europeans occurring in the State of Natal.

VIRGIN ISLANDS

Communicable diseases—March, 1928.—During the month of March, 1928, communicable diseases were reported in the Virgin Islands of the United States as follows:

Island and disease	Cases	Remarks
St. Thomas and St John:		
Chancroid	1	
Gonorrhea	5	
Malaria	3	2 from St. John. Malignant tertian.
Pellagra	1	
Syphilis	11	
Tuberculosis	1	Chronic pulmonary.
Whooping cough	5	
St. Croix:		
Chancroid	1	
Gonorrhea	10	
Syphilis	5	Secondary.
Tuberculosis	2	Chronic pulmonary.

YUGOSLAVIA

Communicable diseases—March, 1928.—During the month of March, 1928, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	27	2	Poliomyelitis	1	
Cerebrospinal meningitis	11	3	Scarlet fever	1,597	276
Diphtheria	224	51	Rabies	1	1
Dysentery	16		Tetanus	18	8
Lethargic encephalitis	1		Typhoid fever	150	10
Leprosy		1	Typhus fever	21	1
Measles	3,932	78			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	April, 1928: 7	April, 1928: 14
China:																				
Amoy	C	28	72	16																
	D	7	3																	
Canton	C	31	36	14	12	1											1	1		
	D	16	25	14	11	1											1	1		
Foochow	C	P	P	P																
Hong Kong	C	P	1	P																
Shanghai (settlement and concession)—																				
Foreigners only	C	1	6	3																
Including natives	D	20	74	7																
Swatow	C	42	P	P	P															
	D		P	P	P															
Tientsin	C	P	15	2	P	1														
Dutch East Indies: Java—Batavia	C				28	3														
	D				18	3														
India	C	45,163	31,390	20,160	23,047	25,139	15,377	3,267	3,097	3,026	3,001	2,865	3,047	3,256						
	D	22,051	15,895	10,371	12,863	15,026	8,863	1,765	1,739	1,684	1,562	1,529	1,686	1,755						
Bassein	D									1			1	1			4	25	22	20
Bombay	C	42	3		2				1						1	1				
	D	30	2		2										1	1		1		
Calcutta	C	87	76	101	199	428	176	39	36	70	58		80	99	162	164	190			
	D	40	30	64	138	281	125	18	24	38	32	35	42	63	101	94	122	114	112	111
Madras	C	547	59	14	13	1	1	1			1		3	11			7	1		
	D	278	48	8	7	2	1		3		1	2	2	7	7		2	1	1	4
Madras Presidency	C	7,600	3,056	2,050	3,073	3,702	1,864	1,163	1,301	1,305	912	930	839	621						
	D	3,512	1,581	1,055	1,736	2,104	984	623	813	726	498	504	457	357						
Negapatam	C							4												
	D							4	1		1	2	2							1
Rangoon	C	1	2	6	2	8	4	4		1	1	10	12	3	4	4	7			
	D	1	2	5	5	6	3			1	1	8	4	2	4	2	3	6	5	2
Tuticorin	C			1		8													10	43
	D			1	37	14										1			8	26

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928	
								21	28	4	11	18	25	3	10	17	24	31	7	14
India (French):																				
Chandernagor	C	1	1		6	10	14	1		5		2	2							
	D	1			6	10	9			1		2	2							
Karikal	C	18	1		1	1	8	9	7	8	8	2	2	2						
	D	12	1		1	1	4	5	4	5	5	2	1	2						
Pondicherry	C	12	15		1	25	11	2	3	2	5	17	10	6					1	2
	D	11	15		1	21	12	2	3	2	3	12	4	3					1	2
Indo-China:[1] Saigon	C		1	1			3	1	1		2	1	5	2	8	27	13	21	35	50
	D						1				1	1	1		6	19	8	12	20	37
Iraq[2]																				
Kwangchow-wan[1]																				
Philippine Islands: Manila	C	1																		
Siam	C	77	40	18	110	88	110	50	33	48	69	74	59	84	78	53				24
	D	53	24	11	76	64	80	34	21	42	42	50	38	73	53	39				17
Bangkok	C	2	3	5	4	3	21	11	28	28	34	23	17	12	8	8	12	16	24	
	D	1	1	3	2	2	11	7	16	26	17	12	11	7	6	5	5	12	11	
Straits Settlements: Singapore	C				7	5	23	2			1					1				
	D				5	4	12	1								1				
On vessel:																				
S.S. Adrastus: At Yokohama, Japan	C	1																		
	D	1																		
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C																		P	
S. S. Taberistan: At Basra, Iraq	C			1																

[1] See 10-day table below.
[2] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 281 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death, Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa; 105 cases, 71 deaths; Karbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths

Place		July-September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928			March, 1928		
				1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31
Indo-China (French):																		
Annam	C	3,179	226	13	75	38	16	2		79	95	93	23	36	14	18	18	23
Cambodia	C	251	180	56	1	28	21	12	39	30	9	15	38	22	51	33	22	92
Cochin-China	C	469	178	21	27	52	17	38	58	46	119	130	178	113	153	206	217	245
Laos	C	246	67	10														
Tonkin	C	1,297	1			1			2	1								
Kwangchow-Wan	C	16																

Place		Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Dec. 18, 1927-Jan. 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928		
							21	28	4	11	18	25	3	10	17	24	31	7	14	21
Algeria:[1] Oran	C	1		2																
	D	1																		
Arabia: Aden	C					19	13	22	54	89	63	45	77	158	189	148	151	163	108	
	D					7	8	8	33	55	50	31	26	99	134	135	134	126	97	
Argentina:																				
Bahia Blanca district	C				3															
Buenos Aires	C									2										
Cordoba Province	C		P	P	10	2													5	
Firmat	C				1															
Quilino	C				3															
Rosario	C				4	5		4			1									
Santiago Province	C										1									
Ucacha	C				1															
Azores: St. Michaels Island	C	2	3	3	3	2	3	1	2	2	1	1	1		1					
	D	1	1		1	1	1	1	1	1			1		1					
Brazil:																				
Bahia	C					4	2		2	1	4	4						P		
	D					4		1	2	1	2	3								
Porto Alegre	C												2							
Rio de Janeiro	C						1		1	2	1	1		1	2					
	D									1	2				2					

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928		
							21	28	4	11	18	25	3	10	17	24	31	7	14	21
British East Africa:[1]																				
Tanganyika	C		P	P	P	P			2				3							
	D								2				3							
Uganda	C	226	99	99	67	79	16			7	13									
	D	158	88	96	61	64	12			6	10									
Canary Islands: Las Palmas	C		9		3	3	1				1				2		2			
	D				1	1	1				1									
Teneriffe	C						1	3	3	3										
	D						1		3											
Ceylon: Colombo	C	3	1		6	7	1	1	1		3	3	4	1	3		4			
	D	3			6	6	1	1			1	3	1	1	3		2			
China: Tungliao	D		200																	
Dutch East Indies:																				
Balik-Papan	C					1														
	D					1														
Celebes—Makassar	C			6	2	6	2	1	1	1		1								
	D			6	2	5	2	1	1	1		1								
Java	D	482	779	829	1,017	751	197	214												
Batavia and West Java	C	68	130	132	154	128	46	37	27	31	15	24	33							
	D	68	129	132	152	128	44	37	27	31	15	24	33							
Cheribon	C				1															
	D				1															
East Java and Madura	C	18	17	10	8	7	5	2					1							
	D	18	17	10	8	7	5	2					1							
Pasoeroean Residency	C				P															
Surabaya Residency	C				P												1			
	D																1			
Surakarta Residency	C			P	P															
Ecuador: Guayaquil[1]																				
Egypt:																				
Alexandria	C	1			12	5			1		1									
	D				7	2			1		1									
Cairo	C					2														
	D					2														

[illegible]	C																			1
	D																			1
Minieh Province	C																			32
	D																			5
Suez	C	1				1	1		3		3	4	3	3		4	7	3		3
	D					1	1		1		3	3	2	1		2	3	4		2
Greece:																				
Athens and Piraeus	C	3	1			3														
	D		1			1														
Mitylene	C	5	1	3	3															
Patras	C	2	1	1																
	D		1	1																
Hawaii Territory: Hawaii	D										1									
India	C	2,710	3,246	3,600	5,518	7,097	2,544	2,699	3,601	3,808	5,188	5,776	6,136							
	D	1,428	1,792	2,065	3,269	4,925	1,653	1,661	2,577	2,630	3,585	3,999	4,828							
Bassein	D	14	8	4	4	17	3	3		2	1	2	4	5	5	5	7	5	4	
Bombay	C	7	4			3	5	4	2	3	5	14	7	7	4					
	D	5	3			3	2	2	3	2	6	14	7	6	4	11	25	21	15	
Calcutta	C	18				2														
	D	10						1												
Madras Presidency	C	465	583	470	791	550	107	132	79	134	142	112	64	53				2		
	D	230	298	282	359	206	63	64	60	69	79	72	34	27						
Rangoon	C	6	11	11	15	17	8	9	7	11	15	16	6	11	5	11				
	D	6	11	11	15	16	7	7	6	10	12	15	6	10	4	9	5	8	5	
Indo-China:[1] Saigon	C	2		1																
Iraq:																				
Baghdad	C						1	1		2		1	1		2		1		1	4
	D						1			1		1	1		2	1	1		1	
Dulaim Liwa	C								1											
Madagascar[1]																				
Mauritius[1]																				
Nigeria:[1] Lagos	C			17	13	10	2	3	3	2	2	3	2	1	2				2	
	D			17	13	8	3	3	3	2	2	3	2	1	2				1	
Peru[1]																				
Senegal:[1 2]																				
Baol	C	72	95	P	P															
	D	33	40																	
Cayor	C	463	176	48																
	D	233	88	28																
Dakar	C	20	1																	
	D	12																		
Louga	C	5	8																	
	D	4																		
Rufisque	C	16																		
	D	12																		
Thies and vicinity	C	9	1	1														8		
	D	7																4		

[1] See monthly table below.
[2] During January, 1928, 5 cases of plague were reported in interior of Senegal; 17 cases with 13 deaths during last 2 weeks in February; 8 cases and 4 deaths, Mar. 11 to 20, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928		
							21	28	4	11	18	25	3	10	17	24	31	7	14	21
Siam	C		13	1	3	16	5	3	6	6	13	4	11	14	7					11
	D		9		2	11	1	1	5	5	10	4	10	12	6					
Bangkok	C		2			1		1	1		1						1			
	D			1		1		1	1		1						1			
Straits Settlements: Singapore	C			1						1	1	1		1		1				
	D			1						1	1	1				1				
Syria [1]																				
Tunisia [2]																				
Turkey: Constantinople	C	1	1		2															
	D		1		1															
Union of South Africa:																				
Cape Province	C			2	2		1													
	D			2	1		1													
Orange Free State	C			1	8			2		3	4	1			3					
	D			1	6			1		3	1				3					
U. S. S. R.:																				
Chita district	C		1																	
	D		1																	
Northern Caucasus	C	14	1																	
	D	10																		
Venezuela: State of Miranda—Tacata and Cua	C													P						
On vessel:																				
At La Plata, from Rosario, Argentina	C					1														
S. S. Aghios Gerasimos, at Vigo, Spain	C			3																

[1] See monthly table below.
[2] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Algeria: Algiers	C		2				
Angola	C		3				
British East Africa: Kenya	C	95	62	26			
Ecuador: Guayaquil	C	15	18	4	6		
	D		5	4	3		
Indo-China (French)	C	14	10	7		5	
Kwangchow-wan						18	
Madagascar	C	314	692	427	342		
	D	286	605	388	317		
Ambositra Province	C	7	25	105	67		
	D	7	17	96	66		
Antsirabe Province	C	39	109	117	108		
	D	38	108	117	108		
Itasy Province	C	36	104	33	19		
	D	41	94	29	17		
Madagascar—Continued.							
Moramanga Province	C	12	95	19	25		
	D	12	83	19	24		
Tananarive Province	C	211	408	155	123		
	D	189	354	129	102		
Mauritius	C	1					
Nigeria	C	32	63	16			
	D	29	61	16			
Peru	C	34	34		41		
	D	19	11		14		
Callao	D	3	3				
Lima	C		7				
	D		3				
Senegal	C						52
	D						32
Syria: Beirut	C		2				

SMALLPOX

Place		July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Dec. 18, 1927-Jan 14, 1928	Week ended— January, 1928: 21	28	February, 1928: 4	11	18	25	March, 1928: 3	10	17	24	31	April, 1928: 7	14	21
Algeria [1]	C	459	382	683	661	170	129	17	18	20	16	30									
Algiers	C					3	9	3	1	7	4	4		5	1		2	2	1		
Oran	C	9	16	11	20	39	29	2	2	4	3	1		2	2		2	10			
Angola. [1]																					
Arabia: Aden	C				1	3	1					1									
Brazil: [1]																					
Para	C	1																			
Rio de Janeiro	C	6	10		1																
	D	4	9		1													1			

[1] See monthly table below.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	28	February, 1928: 4	11	18	25	March, 1928: 3	10	17	24	31	April, 1928: 7	14	21
British East Africa: [1]																					
Kenya-Mombasa	C																1				
Tanganyiki	D	21	8	P	P	P	8	4	0	1											
British South Africa:																					
Northern Rhodesia	C	55	39	164	185	252	236	3		230		79	117	38	63						
	D	1	2	11	64	62	31			23		5	32	2	3						
Southern Rhodesia	C				3	2	1			P	3	2	4	P	3	4					
	D												1								
Canada:																					
Alberta	C	17	17	23	10	19	11	1	19	1	6		3		7	7	20	7	13		
Calgary	C	1														1					
Edmonton	C			1	1	8	5	1			2	1		11	1	1	11	1	7	2	
British Columbia: Vancouver	C		2			4	8	11	3	1	11	2	1	3	4	2	5	6	4	11	
Manitoba	C	13	9	7	19	7	11		1												
Winnipeg	C	5	4	2	2	2	2	1	1												
New Brunswick	C						1						1								
Nova Scotia	C		2	1																	
Halifax	C		1	1																	
Ontario	C	60	22	96	264	347	212	52	77	63	51	40	51	36	20	19	35	20	9		
Hamilton	C					2										2					
Kingston	C				1		1				1									2	
Ottawa	C	27	40	67	134	63	60	20	16	23	9	11	3	1	7	6	8	10	2		3
Toronto	C		2	10	34	39	28	8	5	1	6	4	4	2	4	2	3	3	1	2	4
Windsor	C			9																	
Quebec	C	1		8	25	16	44	7		11	8	11	13		18	22	40	35	15	20	25
Montreal	C				1		8	3	4	1		5	1	3		6	3				6
Quebec	C					4	5		5				2	5	4	3	4	4	5	4	
Riviere du Loup	C				3																
Sherbrooke	C																	3			
Saskatchewan	C	14	68	31	34	58	52	39	15	9	34	7	8		7	14	7		12		
Moose Jaw	C	10	16	3		1	4	4	2	3	2		2	6	5	2	5			3	
Regina	C	8		5	1	1												1	2	3	2
Saskatoon	C					2	4	13	1		1		2								
Ceylon: Colombo	C	1			1	2		1		1	2	2	1	3					1		
	D	1				1		1									1				

China:																					
Amoy	C														1	1	2				
Antung	C						1														
Canton	C	4	1												2	3	2		2	1	
	D		1																		
Chefoo	C		1	P		P										P					
	D		1											1							
Foochow	C	P	P	P	P	P	P		P		P		P		P						
Hong Kong	C	1	2				1	1		1		1	3		3	5	7	10	10	4	
	D	1	2				1		1	1			1	1	2		2	5	12	7	
Manchuria—																					
Changchun	C					1			4											2	
Dairen	C			1	2	1	5	1		5	9	3	4	6				4	6	7	
	D			1					1	2	5	4	2	1							
Fushun	C		1		1																
Harbin	C					2	1		2	1	2	2	1	3	1	2	3				
Mukden	C			2	1				1		3	18		3				1			
Pensihu	C			1																	
Shanghai—																					
Foreigners only	C							1	2		2	1	1	1	3	1	1	3			
Including natives	D							3	2	3	3	5	4	4	6	2	1	3	3	3	
Tientsin	C		4	13	8	9	8	20	10	10	8	5	2	2	11	4					
Chosen.[1]																					
Curacao (alastrim)	C							2				3									
Dominican Republic: Santo Domingo	C															2					
Dutch East Indies:																					
Borneo—																					
Pontianak	C												1								
Samarinda district	C				P																
South and East Borneo Residency	C	P																			
Java—																					
Batavia and West Java	C	4		4	25					1	3		1		1	4					
	D				15																
East Java and Madura[2]	C	4	22	8	9	9	5	2						8							
	D			1																	
Sumatra—Medan	C					3	9	3	5	5	10	7	2	1	3	6					
	D					2	3	4	4		3				2	4					
Ecuador.[1]																					
Egypt	C		3			4	4				1		1	1					52	11	
	D		1	1		1													33	6	
Cairo	C					2															
France.[1]																					
Gold Coast.[1]																					
Great Britain:																					
England and Wales	C	568	506	473	902	1,041	1,175	405	370	386	369	369	392	365	347	359	342	322	318		
Birmingham	C	1		1				14	17	11	2	1		2		1				1	
Bradford	C				11	19	32	6	9	7	2	7	1		4	9		5	5		
Bristol	C			6	4	8			2		1			1	3		2	8	2		
Cardiff	C				1		1											5			
Leeds	C	5	3	7	5	16	11	1			2	1	2	4	2	3	5	3	3	2	
Liverpool	C						1								1						

[1] See 10-day and monthly tables below.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928 21	28	February, 1928 4	11	18	25	March, 1928 3	10	17	24	31	April, 1928 7	14	21
Great Britain—Continued.																					
England and Wales—Continued.																					
London	C							2		1	5	10	1	2	1	10	5	1	1		
Manchester	C			3	6	25	5	11	6	4	4	1	4	1	2	4	3	3	4	2	
Newcastle on Tyne	C	1	2	6	9	55	22	14	3	4	6	4	1	4	3	3	4		2		
Nottingham	C						13	4	8	6	9	6	1	3	1	5	1	6	1		
Sheffield	C	2	1	10	6	9	14	4		4		1	2	2	1				1		
Stoke on Trent	C	1					4			1		2	4	3	6	11			1		
Greece:[1] Saloniki	D	2																			
India	C	5,911	4,398	3,153	4,052	6,731	10,676	4,129	3,631	5,150	4,858	4,567	4,220	5,251							
	D	1,668	1,120	715	927	1,650	2,429	964	803	968	954	1,073	938	949							
Bassein	C	1									1										
	D	1																			
Bombay	C	33	12	10	4	9	14	10	23	10	18	29	23	46	51	49	58	62	49	56	
	D	19	8	2	3	2		2	8	7	7	15	13	23	22	24	33	36	27	32	
Calcutta	C	27	22	5	5	25	36	14	11	23	10	9	18	14	30	20	29	45	40	49	
	D	25		6	2	11	27	10	7	10	7	5	11	10	24	15	21	33	35	32	
Karachi	C														1	1					
	D														1						
Madras	C	6	7	8	7	11	21	9	16	20	29	15	33	21	31	30	27	45	81	49	
	D		2		2	3	6	3	2	2	1	3	3	3	10	5	3	6	15	16	
Negapatam	C	3	1				5		4	2	2	1		1	1					1	
	D	2	1				3		2	1										1	
Rangoon	C	14	9	17	6	14	136	41	34	103	97	68	82	132	95	96	82	92	80	62	
	D	3	2	3	1	4	31	13	10	18	23	22	24	26	32	28	17	34	23	24	
Vizagapatam	C		2				3	2	1	5	2		1		1			3			
	D		2					6	1		1										
India (French):																					
Karikal	C	3	1	2	P																
	D	3	1	2																	
Pondicherry	C	39	37	38	42	41	65	15	17	15				6	3		6	5	7	12	
	D	31*	37	38	42	41	50	15	17	15				6	3		6	5	7	12	
Indo-China:[1] Saigon	C	1	1			1	3						2		1						

Iraq:																					
Baghdad	C		1	7	5	25	23	7	6	3	3	2		3	2	3					
	D			4	4	14	12	3	5	2	1	1		1	2	3					
Basra	C	1	4	2	3	4	2	1				1		2	4	4	4				
	D	1	4	2	1	3	1									1	1				
Italy:																					
Leghorn	C													1		1					
Palermo	C																	3	2		
Rome and vicinity	C		1				2														
Jamaica (outside Kingston) (alastrim)	C	6	9	9	7	3	2		4	1		1	3		6	3	2				
Kingston	C		3	2																	
Japan:																					
Nagasaki	C	2																			
	D	1																			
Tokyo	C							2	1		1		1		3	1	3				
	D								1					1	1						
Tokyo Prefecture	C																17				
Latvia [1]																					
Mauretania	C											P	P								
Mexico: [1]																					
Acapulco	C		2		1																
	D		2		1																
Chihuahua	D						1														
Jalisco (State)	C																		P		
Guadalajara	D					2								1					2	2	1
Manzanillo	D						1									1					
Mexico City and surrounding territory	C					4				1	1	2									
San Luis Potosi	D	1																			
Tampico	C												1								
Torreon	D	1		2																	
Morocco [1]																					
Nigeria: [1] Southern Province	C													7							
Palestine: Jerusalem	C					1			1												
	D								1												
Persia [1]																					
Poland	C	2				1	6	1	1	1		1				1					
	D	1																			
Porto Rico [2]																					
Portugal:																					
Lisbon [1]	C		3	8	4	10	12	5	2	2	3	3	9	4	4		2				
	D					1															
Oporto	C		1																		
Senegal: Dakar	C												8		26	17					
	D															12					
Siam	C	51	27	6	1	9	23	13	7	5	10	1	7	1	3			3			
	D	10	15			1	2	1	1	2		1	1		1			2			
Bangkok	C		3		1	1	3														
	D		1				1														

[1] See 10-day and monthly tables below.
[2] The report of the presence of smallpox in the vicinity of Fajardo, Porto Rico, which has appeared in the Public Health Reports was erroneous. No smallpox has been reported in Porto Rico for several years.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C, indicates cases; D, death; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct 23–Nov. 19, 1927	Nov. 20–Dec 17, 1927	Dec. 18, 1927–Jan 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928	
								21	28	4	11	18	25	3	10	17	24	31	7	14
Spain:[1]																				
Malaga	D				1	1														
Seville	C						1													
Valencia	C			1			2								1		1	1		
Straits Settlements: Singapore	C				1					1		1				1				
Switzerland	C						2													
Syria[1]																				
Tunisia: Tunis	C						4		3			2	4	2	6	1				
Union of South Africa:																				
Cape Province	C	P		P				P			P									
Natal	C										P	P			P					
Orange Free State	C	P			P	P	P	P			P									
Transvaal	C			P	7															
Upper Volta	C											2	3							
Union of Soviet Socialist Republics[1]																				
Venezuela: Maracaibo	D		2	1							1				1					
On vessel: S. S. Arendskerk at Singapore from Amoy, China	C																	P		

[1] See 10-day and monthly tables below.

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927	December, 1927			January, 1928			February, 1928			March, 1928			Apr. 1-10, 1928
							1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	
Algeria	C	376	450	382	682														
Oran	C	14	10	16	11														
Indo-China (French)	C	19	3	21	25	38	10	4	20		40	18	60	31	90	57	71	69	
Syria:																			
Aleppo	C								1		1								
Beirut	C						1		1			15	11	26		12	7	4	8
Damascus	C		3	5	22	13	4	6	2	11	2						1		

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Angola	C	51	73	71	7	18		
	D		2					
Congo	C	5	77					
Cuanza-Norte	C	1						
Cuanza-Sul	C		2		7	10		
Loanda	C	1						
Zaire	C	3	4	1				
Brazil: Porto Alegre	C	11	4	1			1	
British East Africa: Zanzibar	C		2					
	D		1					
Chosen	C	21	2	2		4	21	
	D	6		1		2	8	
Ecuador: Guayaquil	C	4	1	1	4	2	9	
France	C	37	7	4	14	11	10	
Gold Coast	C	7	4					
Greece	C	10	4		5	6	11	19
	D						2	2

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Latvia	C		2				1	
Mexico	D	221	132	157				
Morocco	C	180	81	140	401	55	47	30
Nigeria	C	820	223	93		275		
	D	173	51	30		39		
Persia	D			2		7		
Portugal	C					143		
	D					22		
Spain: Madrid	D			1				
U. S. S. R.:								
Railways, etc	C	26	7	11	15	18		
Other territories in Europe	C	366	220	471	565			
Transcaucasus, Siberia, and Central Asia	C	80	40	21	20			
Ukraine	C	27	11	20	17	6		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C, indicates cases; D, death; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	April, 1928: 7	April, 1928: 14
Algeria:[1]																				
Algiers	C								1					1	2	1	1	2		
	D													1						
Oran	C						4		2			2	1	6	1	1		2		
Argentina[1]																				
Austria: Vienna	C									1										
Bulgaria:[1] Sofia	C			17	6	1	6	1								3		3	14	
	D				1															
Chile:																				
Antofagasta	D			1																
Valparaiso	C		1		1	2	1							1						
	D	2	1		2															
China:[1]																				
Manchuria—																				
Dairen	C																			7
Harbin	C	2			1															
Tientsin	C		2																	
Chosen[1]																				
Czechoslovakia[1]																				
Egypt	C	2		12	4	14	8	2	6		1		18	3	1		1	1		2
	D	3		5		8	4		2				5	3			1			
Cairo	C					3														
	D					3														
Port Said	C			1		1														
Greece[1]																				
Japan[1]																				
Ireland (Irish Free State):																				
Cork County	C					3	1													
Donegal County, Letterkenny	C			4																
Latvia[1]																				
Lithuania[1]																				

Mexico:																				
Guadalajara	D					1														
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	15	2	1		2	1		4	3	6	6			
	D				2	1	5							3	1		3			
Monterey	D																1			
Morocco [1]	C						342	257	214	370	210	141			175	172	167	219	190	
Palestine	C	11	1	5	3	9	8		2	2	1	1	2	6	1	5			2	3
Peru [1]																				
Poland	C	50	35	19	64	93	195	101	92	87	66	57	62	57	89	90	90			
	D	6	2	4	11	10	16	4	3	5	7	10	3	-7	6	5	6			
Portugal: [1] Oporto	C	1			1						1									
Rumania	C	36	16	17	23	35	68			15	24		14	26	28	29				
	D	1		2			3			2	7			4	1	2				
Syria: [1] Aleppo	C		2				2													
Tunisia	C	14		3	1	1	6	4				1				13		5		
Union of South Africa:																				
Cape Province	C	P	P	P	P	P	1	P	P	1	P	P	P							
Natal	C	P	P	P	P	2	3		P		1	P	P							
Orange Free State	C			P		P				P	P	P	P							
Transvaal	C	1		5	P	P														
U. S. S. R. [1]																				
Yugoslavia [1]																				
On vessel: S. S. Gaika at Durban, Natal—from Mauritius	C													1						

Place		1927				November, 1927			December, 1927			January, 1928			February, 1928		
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Algeria	C	67	33	10	12												
	D	13			1												
Algiers	C	2	2	6	2												
Bulgaria	C	12	24	7	2						2	7	6		8	12	6
	D		1	2	1						1		1		1	2	2
Morocco	C	148	76	7	11	5	14	7	5	6	75						

[1] See 10-day and monthly table below.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928
Argentina: Rosario	C			1			
	D				1	1	
China: Shanghai	D			1			
Chosen	C	90	16	26	38	183	400
	D	8	1	2	3	19	44
Chemulpo	C	3				1	
Gensan	C	2				1	
	D					1	
Seoul	C	5	2				
	D	1	1				
Czechoslovakia	C	12	1		6		
Greece: Athens	C	3			1	2	2
Japan	C	1		1			
Latvia	C	6					1
Lithuania	C	69	9	18	27	86	137
	D	14	1	1	1	10	12
Mexico	D	64	36	29			
Peru:							
Arequipa	D	3	2		1	2	
Lima	D	8					
U. S. S. R.:							
Railways, etc.	C	77	23	33	46	41	
Transcaucasus, Siberia, and Central Asia	C	208	61	49	80	7	
Ukraine	C	295	151	198	282	533	
Other territories in Europe	C	1,839	521		1,403		
Yugoslavia	C	20	1	1		7	
	D	5				3	

YELLOW FEVER

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
Belgian Congo:																				
Boma	C											3								
	D											2								
Matadi	C											6	12	11	1	5	8			1
	D											2	6	8	2	5	6			
Dahomey:																				
Grand Popo	C						1													
	D						1													

Porto Novo	C	1																		
	D	1																		
Gold Coast:[1]																				
Ashanti-Obuasi	C		1																	
	D		1																	
Ivory Coast	C	1									1									
	D	1									1									
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	38														
	D	3	9	21	31	28														
Dakar	C	1			12	14	2	1	4			1	1							
	D				7	10	2	1	4			1	1							
Togoland	C		1																	
	D		1																	

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

[1] See monthly table below.

TREASURY DEPARTMENT

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WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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THE FULL-TIME COUNTY HEALTH PROGRAM DEVELOPED IN THE MISSISSIPPI VALLEY FOLLOWING THE FLOOD [1]

By J. G. Townsend, *Surgeon, United States Public Health Service*

EMERGENCY SANITATION

The flood caused by the waters of the Mississippi and its tributaries which occurred in the spring of 1927 was one of the greatest and most extensive in the flood history of this river. The following States were flooded: Arkansas, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee. Illinois, to a small degree, also suffered from the effects of the high water.

The total area flooded has been estimated to be nearly thirteen million acres. This represents 20,000 square miles. The number of people affected in this area is estimated at approximately 908,200. With such a large area involved, sustaining a population of nearly a million people, the question of the public health was one of the greatest importance.

In order to care for properly and house the individuals who were forced from their homes, the American Red Cross, with its usual efficiency in such disasters, organized and operated 149 concentration camps in the area, caring for 330,000 people. The distribution of these camps was as follows:

State	Number of camps	Maximum number people cared for in camps	State	Number of camps	Maximum number people cared for in camps
Arkansas	62	133,800	Missouri	18	14,000
Illinois	6	2,500	Tennessee	5	7,300
Kentucky	2	2,200			
Louisiana	33	105,400	Total	149	330,000
Mississippi	23	64,800			

These people were not only housed and fed, but the care of the sick and the prevention of the spread of contagion were also important features of what might be termed the emergency flood-sanitation program, in contradistinction to the permanent post-flood program which was soon to follow.

[1] Presented at the Forty-ninth Annual Meeting of the Louisiana State Medical Society, held at Baton Rouge, La., April 10-12, 1928.

In order to assist the local State health officers and local county health officers in solving these problems, much assistance was received from neighboring States in the furnishing of personnel and biologics. The United States Public Health Service furnished 24 medical officers, 8 sanitary engineers, and 5 scientific assistants, 37 in all. The neighboring States furnished 80 medical officers, engineers, and inspectors. Medical personnel was also furnished by the Rockefeller Foundation. This personnel was detailed only through the requests of the State health officers and was assigned to the State boards of health. Their work consisted in—

(1) Measures toward the safe disposal of excreta through proper latrines in proper locations, properly policed;

(2) Provision of safe water supplies;

(3) The inspection of food and milk supplies furnished concentration camps;

(4) The isolation and quarantine of communicable diseases; and

(5) The immunization against typhoid fever and smallpox.

It has been estimated that in all the States in the flooded area 469,442 individuals were immunized against typhoid fever, receiving three inoculations, and 137,340 individuals were vacinnated against smallpox before the permanent health program began to function about July 1, 1927.

CONTROL OF MALARIA BY MEANS OF SCREENING HOUSES OF MALARIA CARRIERS

This program, developed in the late spring and early summer of 1927, financed by the Red Cross and supervised by engineers of the United States Public Health Service under general supervision of Senior Sanitary Engineer J. A. LePrince, was based on the premise that the major part of any potential spread of malaria would be on the plantations, and that the most effective way of reducing the spread of malaria would be to prevent *Anopheles* mosquitoes from having access to malaria carriers at the farm tenant homes so long as the limited time available and the available funds would allow. The work was organized in Arkansas, Mississippi, Louisiana, and the western portion of Tennessee, this being the first time that so extensive a program had been carried out in this manner.

The plan of procedure was to visit as many homes as possible in the flooded counties to determine whether or not cases of malaria carriers were living there and to screen completely such homes, making them mosquito proof. This was accomplished by inspectors at the time of their visit, who took measurements of doors and sent them to a central point in the State where screen doors were made in conformity with such measurements and shipped to the communities in carload lots. They were hauled to the plantations by

the several plantation owners. The Red Cross assisted the State health departments and cooperating agencies in supplying these inspectors, and also supplied the materials for screening and transportation from the factory to the local communities.

Wire screen was used for all doors and windows with the exception that in some homes a specially prepared netting was used for windows.

The plan of procedure in Louisiana differed from that in other States. Here the State board of health located and listed the malaria carrier farm tenant homes in eight parishes while the assistant State sanitary engineer supervised the construction of screen doors, their shipment, and the installation of all protective screening.

In Arkansas the screen doors were made at the Boys' Industrial School at Pine Bluff; in Mississippi, at Greenwood; in Louisiana, at the State Boys' Industrial School at Monroe, while in Tennessee the manual training department of the public schools at Dyersburg did the work.

This feature of the health program was extensive. The distance from the north to the south end of the entire project was about 320 miles, and the homes to be screened were scattered over 36 counties of four States. Each of the malaria case homes had to be located and the dimensions of the doors taken. In the making of doors about 19 tons of 24-inch sheet steel had to be cut into 337,680 small triangles for screen door reenforcement plates and each triangle had to have holes punched to receive the nails. About 50 miles of 16-mesh wire screen had to be placed on door frames, with a minimum of wastage, in addition to the 7 miles of cotton mosquito bar used on the window frames in some of the counties in Arkansas.

The actual work accomplished in the project was as follows:

	Tennessee	Arkansas	Mississippi	Louisiana	Total, 4 States
Flooded counties in which homes were screened	4	15	9	8	36
Number of homes screened	483	2,348	3,276	653	6,760
Number of doors screened	1,440	7,304	10,238	2,193	21,175
Number of windows screened	2,387	12,200	12,931	2,777	30,295
Average cost of screening a farm-tenant home	$11 66	$9.67	$11 07	$13 99	$11.02
Total cost	$5,630.87	$22,707.35	$36,254.39	$9,883.00	$74,475.60

NOTE.—This table is taken from the report of Senior Sanitary Engineer J. A. LePrince, United States Public Health Service.

The labor cost of making these doors was about 27 cents per door, the average total cost of each door complete being about $1.40. It is realized that all homes with malaria carriers were not screened—only a proportion were; but the fact that nearly 7,000 homes were screened in a period of approximately 90 days is a good start, especially when it is recognized that, so far as it was possible to determine,

these homes represented places where malaria cases resided, and that the number of families containing malaria cases capable of infecting others is but a small proportion of the surrounding farm homes in the vicinity.

The work of further extending the screening program now rests with the full-time county health units, the creation of which was the last step in the flood health program, or which might more properly be termed the post-flood program.

FULL-TIME COUNTY HEALTH UNITS DEVELOPED AS A RESULT OF THE FLOOD

The programs just discussed might be properly termed actual emergency programs, which, of course, were limited to immediate needs; but a time came when the strictly emergency work was curtailed or discontinued as the situation was relieved. It was recognized, however, that a serious problem still existed. In the majority of the flooded counties there were no organized public health agencies to carry on to a logical conclusion the preventive measures started and slight prospects of developing a program, as the counties affected had very little money to appropriate for this work, in some instances being in actual financial straits.

It has long been recognized that the best public health program, and one that will best insure permanency, is the full-time county health unit plan, the community served enjoying the services of a full-time director, full-time nurse, and full-time sanitary inspector. Some communities have more personnel, some less, but that is the standard.

At a meeting in New Orleans in June, 1927, attended by representatives of the Public Health Service, of the Rockefeller Foundation, of the American Red Cross, and of various State boards of health, it was recognized and agreed that some such plan should be formulated and such a program fostered in the so-called flooded counties. This was made possible by a liberal contribution from the Public Health Service and the Rockefeller Foundation, supplementing county and State funds, the counties being asked to appropriate a very small part of the total budget necessary to finance the health units. It was agreed that this fiscal plan would be in operation for an 18-month period from July 1, 1927, to January 1, 1929.

Representatives of the Public Health Service and of the Rockefeller Foundation assigned to the various State boards of health assisted the State health departments in laying this proposition before the various county officials and organizing the programs adopted. Of the 103 counties considered flooded in the six States, 85 were visited, and this plan was presented to the local governing authorities. The result was encouraging in that 67, or 78 per cent, signed the budget and definitely committed the county funds to the project as of October 31, 1927.

Since the October figures were compiled four additional flood parishes of Louisiana have adopted the full-time plan, while two more committed to the project were organized. These six parishes started to function on the first of the year. This gives Louisiana 19 parishes organized on a full-time health plan since the flood.

The total number of counties adopting the full-time plan to date, including those in which no county funds were committed, is 78, or about 92 per cent of the total with which contact was made. There were a few counties that actually had no money whatever to put into a health project, and in these the United States Public Health Service, the Rockefeller Foundation, and State boards of health financed the projects temporarily with a limited personnel. In many counties the work was made possible by donations from the local Red Cross chapters, municipalities, chambers of commerce, and civic organizations.

As is generally the case in the organization of full-time health units, a difficulty of no mean proportion was that of finding suitable trained personnel to carry on the work. In order to meet this difficulty and facilitate the speeding up of the program, the Rockefeller Foundation organized training schools for the practical teaching of field public health work to prospective health officers, nurses, and inspectors. The principal school was located at Indianola, Miss. Without exception the States developing the full-time rural program sent trainees to this school. The Rockefeller Foundation approved the training of the candidates upon request of the various State boards of health. Those accepted were given a grant of their railroad and Pullman fare from their homes to the training school and return to the new field of duty, as well as a per diem allowance while en route and at the school. The number of trainees sent to the school, as of March 15, 1928, is given in the following table:

State	Physicians	Nurses	Inspectors	Total	State	Physicians	Nurses	Inspectors	Total
Arkansas	20	23	17	60	Missouri	0	0	7	7
Kentucky	10	29	16	55	Tennessee	1	0	0	1
Louisiana	13	7	24	44					
Mississippi	4	12	19	35	Total	48	71	83	202

Not all of these trainees were placed on duty, owing to failure to qualify and to resignations. On the other hand, some were appointed without being sent to the school. This does not include the 24 office clerks on duty as of October 31, 1927.

The Rockefeller Foundation submitted an appraisal on each trainee which was of inestimable value to the State boards of health in determining the fitness and ability of the persons seeking these positions.

The public-health programs adopted in these full-time projects were along the same standard lines as elsewhere enjoyed. In brief, activities were directed toward safeguarding the health of the child from before birth to adolescence, through the medium of prenatal hygiene, infant hygiene, preschool and school hygiene. This was accomplished through group conferences or clinics, and the intensive physical inspection of school children for the purpose of locating physical defects and advising the parents to have corrections made through the family physicians. Concomitant with this program were educational measures in newspaper articles, lectures, and the distribution of pamphlets. The local profession was encouraged to report communicable diseases and proper steps were taken toward isolation and quarantine. Prevention of soil pollution was effected by having sewer connections made when possible and the construction of the vault type of sanitary privy, through personal persuasion and the enforcement of the existing ordinances. The inspection of food and milk supplies, vaccination against smallpox, and inoculation against typhoid fever and diphtheria were also stressed and emphasized. A résumé of the work of these full-time projects in the Mississippi Valley from July 1, 1927, through the month of February, 1928, is given in the list below.

Résumé of the work of the full-time projects in the Mississippi Valley from July 1, 1927, through February 29, 1928

NOTE.—These figures present the public-health activities carried on in the newly organized counties and parishes from July 1, 1927, to date, and do not include any activities carried on in the 18 full-time county health projects in the several States which were organized and functioning before the flood. It must also be remembered that many of these counties were not organized and operating until the late fall of 1927, while some were not organized until the first part of 1928

1. EDUCATIONAL:	
(a) Lectures	5, 152
(b) Attendance	166, 996
(c) Bulletins distributed	201, 361
(d) Newspaper articles	5, 807
(e) Circular letters	38, 229
(f) Health exhibits	319
2. SANITARY INSPECTIONS:	
(a) Private premises	37, 749
(b) Public premises—Schools, churches, etc	7, 848
3. SPECIAL INSPECTIONS:	
(a) Dairies	1, 028
(b) Other food-producing or food-handling places	4, 757
4. EXAMINATIONS:	
(a) For life extension advice	470
(b) For work certificates (children)	26
(c) For lunacy	112
(d) Of prisoners	847
(e) Of food handlers	266

5. ACUTE COMMUNICABLE DISEASE CONTROL:	
(a) Visits to cases, carriers, contacts or suspects	11, 673
(b) Cases or carriers isolated or quarantined	5, 831
6. VENEREAL DISEASE CONTROL:	
(a) Suspects examined	1, 191
(b) Prophylactic treatments	48
(c) Curative treatments	1, 675
7. TUBERCULOSIS CONTROL:	
(a) Number examined	775
(b) Positive	170
(c) Negative	269
(d) Placed in institutions	232
(e) Home visits	1, 132
8. PERSONS TREATED FOR REMOVAL OF HOOKWORM	18
9. PERSONS TREATED FOR PREVENTION OR CURE OF GOITER	16
10. SCHICK TESTS	4, 075
11. COWS TUBERCULIN TESTED	3, 587
12. IMMUNIZATION:	
(a) Complete antityphoid administrations	91, 173
(b) Antismallpox vaccinations	42, 045
(c) Complete diphtheria toxin-antitoxin administrations	30, 843
(d) Persons given prophylactic diphtheria antitoxin	640
(e) Persons given antirabic treatment	74
13. CHILD HYGIENE:	
(a) Prenatal—	
(1) Cases given advice	881
(2) Examinations	266
(3) Office consultations	769
(4) Group conferences	120
(5) Home visits	1, 287
(6) Midwives instructed	2, 725
(b) Infant and preschool—	
(1) Babies and children examined	4, 371
(2) Office consultations, mothers	2, 385
(3) Group conferences with mothers	467
(c) School—	
(1) Children examined	113, 394
(2) Found defective	69, 453
(3) Defects found	136, 030
(4) Consultations, parents (office and school)	3, 547
(5) Home visits	18, 098
(6) Talks to classes or drills in hygiene	4, 769
(7) Exclusions for communicable disease	2, 620
(d) Nutritional classes—	
(1) Cases attending	3, 352
15. LABORATORY EXAMINATIONS:	
Specimens—	
Blood for Widal	118
Blood for *B. typhosus*	20
Blood for Wassermann	1, 654
Blood for malaria parasite	4, 791
Smears for *B. diphtheriae*	2, 314
Smears for *gonococci*	260
Sputum for *B. tuberculosis*	446

15. LABORATORY EXAMINATIONS—Continued.

Specimens—Continued.	
Feces for parasites	1, 015
Water for *B. coli*	1, 453
Milk for high bacterial content	255
16. RESULTS:	
1. Sanitary privies installed—	
(*a*) Septic or L. R. S	58
(*b*) Water-tight vault	9
(*c*) Bucket and box	38
(*d*) Pit	9, 037
2. Privies restored to sanitary type	1, 210
3. Septic tanks installed	138
4. New sewer connections	1, 659
5. New water connections	336
6. Wells or springs improved	2, 556
7. Public milk supplies radically improved	178
8. Public food handling places radically improved	867
9. Places producing foods for sale radically improved	196
10. Dwellings effectively screened against flies and mosquitoes	2, 524
11. Stables made sanitary	56
12. Nuisances corrected	2, 505
13. Convictions for violation sanitary laws	5
14. Nutritional cases improved	688
15. Corrections of physical defects induced:	
(*a*) In infants; (*b*) In preschool children; (*c*) In school children; (*d*) In adults	10, 241

MEASURES TAKEN IN THE CONTROL OF PELLAGRA

The diseases which showed the greatest increase during the post-flood period were pellagra and malaria. A definite increase in the pellagra rate was shown on the morbidity reports submitted from the six States, with the exception of Missouri and Kentucky. The greatest increase was shown in the State of Mississippi, where there were reported approximately 6,000 cases in the four months' period July to October, 1927, inclusive. Only 2,800 cases were reported for the corresponding period in 1926. A marked increase in the pellagra rate was also experienced in Arkansas.

The only measures taken to combat the increase in pellagra were through the medium of the distribution of dried brewers' yeast, which was generously supplied by the American Red Cross to various State boards of health. This was distributed through the full-time health departments, which, in turn, in many instances, utilized the farm demonstration agents and other local organizations. In some instances tomato juice in a limited amount was also distributed.

MALARIA CONTROL

In the control of malaria, emphasis was placed on the continuance of the screening program previously discussed. Although the later work was not done free of cost to the owners of homes, at the same time the comfort of properly screened houses was amply demonstrated, and it is believed that a renewed interest in this phase of malaria control is developing. From the reports submitted by Mr. LePrince on the results of the screening program of last summer it was learned that in some instances county health officers have demonstrated at county agricultural fairs how substantially made screen doors can be constructed by farm tenants. In two parishes in Louisiana the health officers undertook a project which includes the screening of all malaria families in his parish. In other States the work is under way for the protection by the screening of all malaria homes in malaria counties. (Work is now (March 19, 1928) going on in six counties of five States as reported by Mr. Le Prince.)

The free distribution of quinine in the form of capsules, pills, and tablets was also carried out by the full-time health departments through the medium of local organizations, quinine being furnished by the American Red Cross. At the present time, however, the Red Cross has retrenched considerably in its policy of supplying this commodity as well as yeast in the control of pellagra.

CONCLUSIONS

While deploring the frightful disaster of last spring, some comfort may be obtained in the knowledge that better communities are builded on the ruins of those destroyed, and, as a rule, a better public-health régime may be inaugurated. Surely in this experience there has developed another flood—a flood of sanitation development which has placed us many years ahead of our old program of full-time county health service. The fact that since July, 1927, 78 counties have joined the roll of those that are enjoying adequate public-health protection through the labors of over 200 full-time health workers is a distinct step forward and a stimulus to perpetuate these endeavors. This can be done only by creating such a popular demand for full-time health protection that it will merit the same consideration in local government as an "educational program" or a "good-roads program."

It is not too much to believe that this will be accomplished and that the Mississippi Valley will enjoy the universal public-health protection it deserves.

REGULAR SESSION OF THE PERMANENT COMMITTEE OF THE INTERNATIONAL OFFICE, NOVEMBER 7–16, 1927 [1]

The Permanent Committee of the International Office of Public Hygiene held its regular session of 1927 from November 7 to 16, at Paris.

There were present: Messrs. Velghe (Belgium), President; Madsen (Denmark), Shahin Pacha (Egypt), Pulido (Spain), Taliaferro Clark (United States of America), Barrére (France), L. Raynaud (Algeria), Duchêne (French West Africa), Audibert (French Indo-China), l'Herminier (Madagascar), G. S. Buchanan (Great Britain), R. A. Needham (British India), C. L. Park (Australia), Le Noblet du Plessis (Canada), S. P. James (New Zealand), P. G. Stock (Union of South Africa), Mataraugas (Greece), Lutrario (Italy), Mitsuzo Tsurumi (Japan), Praum (Luxemburg), Colombani (Morocco), Roussel-Despierres (Monaco), H. M. Gram (Norway), N. M. Josephus Jitta (Netherlands), W. de Vogel (Netherlands Indies), Mimbela (Peru), Djavad-Asthiany (Persia), W Chodzko (Poland), Ricardo Jorge (Portugal), Ionesco-Mohaesti (Rumania), Yoannovitch (Kingdom of the Serbs, Croats, and Slovenes), O. F. H. Atkey (Sudan), C. Kling (Sweden), H. Carriére (Switzerland), D. Prochazka (Czechoslovakia), de Navailles (Tunis), Roubakine (Union of Soviet Socialist Republics), Herosa (Uruguay), also Mr. Pottevin, Director of the International Office of Public Hygiene.

On report of the director, and in conformity with the proposals of its special commission of experts, the committee interpreted some points which might be raised in regard to certain articles of the International Sanitary Convention, as well as the details of the functioning of the services of notifications.

It also adopted the final model of the certificate of deratization or exemption from deratization provided in article 28 of the convention.

As concerns the use of wireless in quarantine operations, the committee was of the opinion that it was advisable to confine itself, for the time being, to establishing a code form which could be adopted uniformly by all countries and in accordance with which communications could be made by the ship to the port authority. This would facilitate, to a considerable extent, the introduction of declaration by wireless communication into quarantine practice. Only by actual use and by taking into account the special conditions peculiar to each country can we estimate the facilities which would be accorded to vessels on the faith of these declarations.

[1] Translated from Revue d'Hygiène et de Médicine Préventive, Vol. L, No 3, March, 1928

The question appears, moreover, to be closely connected with that of the qualifications of, and other questions concerning, ships' surgeons. This subject has again claimed the attention of the committee, which continues to carry on the inquiry undertaken in the several countries.

The committee has received from the Director of the Pan American Sanitary Bureau, at Washington, the official notice that the Pan American Sanitary Conference which met at Lima in October, 1927, adopted a resolution according to which the said Bureau at Washington assumes the obligations of a regional bureau under the terms of the International Sanitary Convention.

The arrangement regulating the methods of cooperation between the Pan American Sanitary Bureau and the International Bureau of Public Hygiene will be submitted to the committee at its next session in May, 1928.

The President of the Maritime Sanitary and Quarantine Council of Egypt, taking part in the sessions of the committee, presented the plan of arrangement established in agreement with the Director of the Office, according to the terms of which the council shall function as regional bureau for the Near East, and, responsible to the International Office, shall exercise for its dependent countries the duties imposed upon it by the International Sanitary Convention. This proposal was adopted. It had previously received the sanction of the Maritime Sanitary and Quarantine Council.

The Office has published, in its monthly *Bulletin*, the portions of the Report on the International Sanitary Conference of the Pacific (Melbourne, 1926) which are of special interest from the epidemiological point of view. On invitation of the Australian Government an international sanitary commission is to study on the spot the epidemiology of the South Pacific. The Office will be enabled to follow the work.

The committee has received and examined the first of the monographs which are to be established, for each country, in carrying out the provisions of several articles (notably articles 14, 28, and 50) [relating to rat conditions at ports, deratization of vessels, and port sanitary equipment] of the International Sanitary Convention, and which will be published by the Office under the form of an international maritime sanitary annual. These first monographs relate to Great Britain (England and Wales), France, and Morocco.

Examination of these documents has made it possible to present specifically a certain number of suggestions which will be useful in giving to the complete publication the character which will best respond to the spirit of the convention.

The Office is collaborating with the League of Red Cross Societies in the preparation of a form of medical instruction for captains of

vessels not having a doctor on board, which can be adopted as an international document. This instruction should include a section relative to hygiene, and to the prophylactic measures the observance of which is of capital importance to prevent the diffusion of epidemic diseases from one country to another by maritime route, and thus falls directly into line with the objects had in view by the International Sanitary Convention.

II

The committee has received a communication of the resolutions adopted at the last session of the Health Committee of the League of Nations, held at Geneva, October 28 to November 3, 1927.

It has examined the technical report of the commission of pharmacological experts which it had charged with the study of propositions made by the Governments relative to preparations, included in the several pharmacopœias, which there might be occasion to withdraw from the provisions of the opium convention of Geneva of 1925, by application of article 8 of the said convention, by reason of the fact that narcotics were there associated with other substances, making abuse and the establishment of addiction impossible. It has approved the conclusions of this report, which will be transmitted to the Health Committee of the League of Nations. Moreover, the same committee has made a new demand to be informed whether the provisions of the opium convention of Geneva should be made applicable to certain products—dilaudide, benzoyl-morphine, and eventually the ethers derived from morphine.

III

The recent epidemics, happily circumscribed, of yellow fever in West Africa and of cholera in Iraq, have given a timely interest to the discussions on yellow fever and cholera. Both have been the subjects of documentary reports, cholera, after deep study made on the spot.

The extension of yellow fever in French West Africa has been closely observed: In 1926, there were 53 cases in Senegal, 2 in Dahomey, 2 in the Upper Volta; in 1927 (latter part of May to mid-October), there were 151 cases in Senegal, of which 104 were followed by death. Syrians, recently arrived in the Colony, were especially attacked; among them there were 25 cases in 1926 and 31 cases in 1927, in a total of 1,000. Living under bad health conditions and rejecting precautions recommended against the bite of mosquitoes, they also showed the sensitiveness to the virus observed generally in the newly arrived. Yellow fever should be considered an endemic disease in West Africa. The native population has to a large extent acquired a spontaneous immunity; the virus is conserved by abor-

tive cases in young children. The arrival of groups of Europeans has frequently, in the history of the disease, been the occasion of epidemic revival. The menace of extension to North Africa and the Mediterranean Basin does not for the moment appear to exist. Classic prophylactic measures and a strict surveillance have been instituted. The data concerning French West Africa, from which cases of yellow fever are regularly reported to the International Office of Public Hygiene, will be completed by the time of the next session by analogous information from the English, Spanish, and Portuguese possessions in West and Equatorial Africa, and the Belgian Congo.

An exchange of views on the subject of the actual status of the question of the pathogenic germ of yellow fever has brought out that the question remains open.

Cholera appeared at the end of July in ports of the upper Persian Gulf—Abadan, Basra, and Mohammerah. The energetic defensive measures taken immediately by the sanitary authorities of Iraq, Syria, Palestine, Egypt, and Persia, prevented its propagation along the land and river routes of travel. In Iraq it did not pass Remaldi on the Euphrates or Baghdad on the Tigris (where there were only four imported cases and one case of local origin). In Persia, it followed the river Karoun to the Dizfould region. The epidemic is now terminated; for Iraq there were 1,038 cases with 756 deaths. Strict quarantine services were established along the danger routes and anticholera vaccination was required of every person going into a neighboring country. This vaccination was very largely practiced in the infected localities, notably in Persia in 40 per cent of the menaced population. The transmission of the infection by merchandise such as dates shipped from Basra was recognized to be impossible after experimental verification.

Indo-China was severely attacked in 1926 by cholera, which prevailed in all the countries of the Union. The number of deaths reached about 15,000. The epidemic is almost at an end. It would have been much more severe but for the extensive employment of anticholera vaccination, which was performed on more than 2,000,000 persons, or more than one-tenth of the population. The proportion of deaths among the vaccinated in Cochin China was 0.79 per 10,000.

Vaccination, either by subcutaneous injection or ingestion of bile vaccine, gave very encouraging results in British India. The research undertaken in that country on the agglutinability of authentic cholera vibrios and vibrios originally nonagglutinable has shown that the first may lose and the second acquire the property of being agglutinated by anticholera serums.

Facts suggesting new problems on the subject of the epidemiology of plague have been reported. It has been agreed up to the present time to attribute a rôle almost negligible to the domestic mouse;

its habitual flea does not seem capable of inoculating with plague virus. But the coincidence of an epizootic of mice and a series of human cases has recently been proved at Oran; on the other hand, in the sandy regions of South East Russia, fodder sometimes conceals numerous cadavers of plague mice which might contaminate man either directly or by the intermediary of camels infected by them. In the same endemic focus a plague carrier has been observed who has planted the contagion around him; and facts more or less analogous have been noted in Algiers and Senegal. It is important to determine definitely for the future whether there exist septicemic forms of latent plague without symptoms and without fever, which would lend themselves to contamination of the vicinity by the intermediary of fleas. It is to such forms that the term "germ carriers" would apply; on the other hand, a bubo without vital reaction is only an abortive form of the disease, and the bacilli which it may harbor appear but slightly susceptible of being disseminated. Finally, the conservation of virulent plague bacilli in the body of the flea, outside its host, has been stated for periods of 3 to 4 months (Union of South Africa), and even 10 months (South East Russia).

The methods of estimating the numbers of rats infesting ships have been studied experimentally at Liverpool. The best basis has appeared to be the enumeration of the droppings, with the reservation that these may be very abundant in spite of there being a small number of rats, and that the quantities vary largely under influence of the alimentary régime of the animals. Nevertheless, the observations made at the quarantine station at the port of New York have shown that, when the authorities have imposed fumigation of vessels guided principally by the amount of droppings discovered, an average of 20.5 dead rats per ship was recovered, whereas in the cases where fumigation was not required only 1.29 per cent of dead rats was found per ship.

Smallpox and antismallpox vaccination very actively preoccupy the health authorities in various countries, and the problems discussed have been many. There seems to exist at present, side by side with grave classic smallpox, a benign type, or "alastrim" (Switzerland, Great Britain), the character of which does not seem to justify the onerous measures of vaccination and especially of isolation which continue generally to be applied to it. Is this type definitively fixed, or is the attenuation of its virus reversible? The desire to reduce to a minimum the prejudices of the public in regard to vaccination has led the United States to study the possibility of limiting the vaccinal field—affirming that the duration of immunity is not in proportion to the dose of vaccine inoculated, employing the multiple pressure method of vaccination, and presenting a mass of practical details.

Post vaccinal encephalitis appears to-day to have struck the Netherlands more than any other country. It is not connected with the virulence of the vaccine, for it has remained practically at the same rate in spite of the employment of slightly virulent stock or of neuro-vaccine; on the other hand, a virus activated by passage through the rabbit has not caused a single case of encephalitis out of 100,000 vaccinations. There seems to exist a family susceptibility; and, on the other hand, for the same number of vaccinations, 16 cases of encephalitis were observed in January-February and none in November-December. The hypothesis of a relation with lethargic encephalitis is being more and more abandoned; besides, post-vaccinal encephalitis is cured without sequellae. A remarkable fact has been brought to light by these discussions; Italy and Japán have not had a single case of post-vaccinal encephalitis; and in those countries vaccination is obligatory in the course of the first year. Other observations concur in justifying the opinion that vaccination of the child is most inoffensive when it is done early.

Poliomyelitis has prevailed with unusual intensity during recent years in England, Switzerland, in 1927 in Rumania, Saxony, and Canada. The cases have been, in general, very much disseminated, although there have been some true foci. The abortive and non-diagnosed forms are as numerous as the clinical cases, or more so, and transmit the virus. Prophylaxis by convalescent serum has given remarkable results in Sweden; also, treatment by an experimental serum in Rumania.

The treatment of general paralysis by inoculation of malaria continues to be closely followed by the sanitary administration in England, where 1,400 cases have been treated. It has been studied in Rumania; also, the frequency of general paralysis in relation with that of paludism in Spain.

Organizations for maternal and child welfare have been established in the United States, Greece, Union of Soviet Socialist Republics, Japan, and Switzerland. In this latter country, infantile mortality has declined from 125 per 1,000 live births in 1906 to 55 in 1926. However, the gain does not relate to stillbirths nor to the first four days of life, which still indicate insufficient protection of the mother during pregnancy and at the moment of delivery.

Finally, the following questions have been touched on, especially as continuations of former discussions or as preparations for work to come: The antiseptics and coloring matters in alimentary substances; the prevention of beriberi in the Netherlands Indies by condensed vitamin B; the legal prescriptions concerning scarlet fever streptococcus toxin and antitoxin in the United States; the vaccination of

the adult by BC-G ["Bacille Calmette-Guérin"] in Norway; the antivenereal program in Japan; the control of medicines in Japan; the antileprosy organization and relief of lepers in the United States; cancer in the natives of North Africa; social aid to seamen of the merchant marine and social aid for the tuberculous in Italy; social aid in Japan; the High School of Malariology of Rome; School of Hygiene of Warsaw.

In closing the session the President recalled that the International Office of Public Hygiene, created by the International Arrangement concluded at Rome December 9, 1907, has now had 20 years of existence. Conformably to the intentions of the Governments that instituted it, it has achieved a permanent bond among the countries signatory to the international sanitary conventions and has not ceased to promote and control the combat against "pestilential diseases." At the same time, while enlarging more and more the circle of its activities, it has widely and effectively concerned itself with the problems, often very diverse, relative to diseases in the case of which social action, and especially concerted action, may contribute to the preservation of populations.

DEATH RATES IN A GROUP OF INSURED PERSONS

Rates for Principal Causes of Death for March, 1928

The accompanying table is taken from the Statistical Bulletin for April, 1928, issued by the Metropolitan Life Insurance Co., and presents the mortality experience of the industrial insurance department of the company, by principal causes of death, for March, 1928, as compared with February and with March, 1927. The rates are based on a strength of more than 18,000,000 insured persons in the United States and Canada.

The health of this group of persons during March, as reflected in the death rate, continued favorable, the rate being the minimum for this month, 10.3 per 1,000, the same as that recorded in March of last year. There occurred the expected seasonal rise from the rate for February, 9.4 per 1,000, which was due, for the most part, to higher mortality from influenza, pneumonia, tuberculosis, heart disease, and Bright's disease.

As compared with March of last year, declines are shown for three of the four principal epidemic diseases of childhood—measles, scarlet fever, and whooping cough—for typhoid fever, and for tuberculosis, cancer, diarrhea, and enteritis, puerperal causes, suicides, homicides, accidents, and automobile fatalities. The death rate for tuberculosis was 100.1 per 100,000, as compared with 114.4 for March last year,

which was the previous minimum rate for this month. The Bulletin states:

This low rate for tuberculous disease is one of the best measures of the success which has attended the campaign against tuberculosis in America. It should be remembered that March and April are the months which register the maximum death rates for tuberculosis year after year, whereas the lowest are almost always recorded in September. Only eight years ago—that is, in March, 1920—the tuberculosis mortality rate among the industrial policyholders was 178.7 per 100,000 and the September figure was 116.1. Thus the death rate in 1928, *in the month of highest mortality*, has actually declined to a point below that recorded only eight years ago in the month of lowest mortality.

On the other hand, considerably higher rates this year than last are shown for heart disease, pneumonia, and Bright's disease, and slight increases for influenza, diabetes, cerebral hemorrhage, and respiratory diseases other than pneumonia.

Death rates (annual basis) for principal causes per 100,000, March, 1928, as compared with February and with March, 1927

[Industrial insurance department, Metropolitan Life Insurance Co.]

Causes of death	Rate per 100,000 lives exposed [1]			
	March, 1928	February, 1928	March, 1927	Year 1927 [2]
Total, all causes	1,027.0	943.5	1,028.5	885.4
Typhoid fever	1.3	1.7	3.0	4.6
Measles	7.7	4.2	7.9	4.1
Scarlet fever	3.4	4.4	4.9	3.1
Whooping cough	6.2	4 1	8.3	6.4
Diphtheria	11.4	12.6	11.3	10.5
Influenza	34.8	25.6	32.3	17.7
Tuberculosis (all forms)	100.1	89.5	114.1	93.3
Tuberculosis of respiratory system	88.6	78.6	100.3	81.7
Cancer	74.8	76.3	77.2	74.0
Diabetes mellitus	20.4	18.6	19.2	16.7
Cerebral hemorrhage	59.6	57 9	58.9	54.9
Organic diseases of heart	160.7	149.4	149.4	132.2
Pneumonia (all forms)	137.3	117.4	119.9	77.6
Other respiratory diseases	21.9	18.2	19.9	15.4
Diarrhea and enteritis	14.7	14.0	16.3	24.5
Bright's disease (chronic nephritis)	82.3	75.5	79.6	69.3
Puerperal state	13.8	13.3	17.2	15.4
Suicides	9.3	7.0	9.9	8.3
Homicides	6.2	5.6	8.1	7.2
Other external causes (excluding suicides and homicides)	48.3	55.6	55.9	63.7
Traumatism by automobiles	11.2	15 8	12.3	18.3
All other causes	212.5	192.6	215.0	186.7

[1] All figures include infants insured under 1 year of age.
[2] Based on provisional estimate of lives exposed to risk in 1927.

COURT DECISION RELATING TO PUBLIC HEALTH

Compensation for tuberculosis allowed under workmen's compensation act.—(Ohio Court of Appeals; Industrial Commission *v.* Rice, 160 N. E. 484; decided June 6, 1927.) An employee was incarcerated in a furnace by a falling door, and for a period of three minutes breathed heated fumes and gas from oil which had been burned as a fuel

therein. He was thereafter physically incapacitated to perform labor, and later tuberculosis resulted. Claim was brought under the workmen's compensation act but was disallowed by the State industrial commission on the ground that the disability was not due to an injury. On appeal to the court of common pleas compensation was awarded. The commission carried the case to the court of appeals, which said that the court of common pleas "was warranted in finding that the incapacity to work and the tuberculosis resulted directly from injury caused by inhaling such injurious substances, and that such finding is not manifestly against the weight of the evidence." The appellate court held that the tuberculosis and any other disability caused by the fumes and gas were compensable.

PUBLIC HEALTH ENGINEERING ABSTRACTS

The Effect of Various Chemicals on the Spreading and Penetration of Oils in Different Mosquito Breeding Places. Joseph M. Ginsburg. Proceedings of 14th Annual Meeting of the New Jersey Mosquito Extermination Association, 1927. (Abstract by L. L. Williams, jr.)

The author emphasizes the need for increasing the spreading power of oils and of increasing spread and toxicity of the cheaper fuel oils.

He recounts the theories of the mechanism of "spread" as put forward by Harkins and by Langmuir, which ascribes the spreading power to the presence of either active (or polar) groups (such as OH, COOH, etc.), or double bonds in the hydrocarbon chain. Such a double or triple bond acts similarly to a polar group (OH, etc.), and is attracted by water and, hence, causes "spreading." The author concludes that, therefore, an oil containing unsaturated hydrocarbons should spread more rapidly than an oil free from these hydrocarbons. Tests confirmed his theory.

He tested varying percentages of 35 compounds and had greatest success with monohydric alcohols, phenols, cresols, xylenols, pine oils, and turpentine. Of these, the cresols proved best both as to spreading power and toxicity.

Using fuel oil as a testing medium, the most effective mixture was made by adding 1 per cent cresylic acid. This spread 1½ times as much as plain fuel oil, penetrated among weeds and flotage, and killed larvæ within half an hour. On sewage beds, 3 per cent cresylic acid was necessary to produce larval death within half an hour, whereas pure kerosene took twelve hours. After kerosene, breeding was resumed in less than 3 days; after fuel oil with cresylic acid, no signs of breeding were seen after 3 days.

The mixture of 1 per cent cresylic acid with fuel oil was tried with uniform success on pools, ditches, vegetation-covered ponds, cattail swamps, and salt marsh areas. It increases the cost of the oil less than 1 cent per gallon.

A Container for Field Collection of Mosquito Larvæ. Wm. A. Hoffman. *Science*, vol. 66, No. 1716, November 18, 1927, p. 484. (Abstract by L. M. Fisher.)

The container consists of a 4-ounce jar with a two-holed rubber stopper, through which two glass tubes are passed, one flared, funnel shaped, through which the larvæ can be passed. A metal clamp is fitted tightly to the neck of the jar by means of a tension spring. One end of the clamp hooks over the carrier's belt.

It is stated that fairly satisfactory results were obtained over a period of four months' use in Porto Rico.

(Abstractor's note: A large percentage of larvæ were drowned in containers somewhat similar to the one described when carried about on the person during collection trips in some of the Southern States. Better results were obtained by carrying larvæ on moistened blotting paper or cotton in a suitable container permitting a certain amount of evaporation to keep the larvæ cool.)

Some aspects of house fly control. D. W. Wallace. *Health Bulletin*, Department of Public Health, Victoria, Australia, No. 11, July–September, 1927, pp. 338–341. (Abstract by R. E. Tarbett.)

The article concerns itself with the viability of the newly hatched fly under adverse conditions. The newly hatched fly is able to work its way out of earth or other matter in which the pupa is buried, through the inflation and deflation of a frontal sac attached to the head between the eyes.

Experiments showed that house flies (*Musca domestica*), on emerging from the pupæ, were able to work their way through a covering of 6 to 7 inches of garden soil and a double layer of 2-millimeter mesh mosquito netting. Passage through the netting was made by inserting the sac within the mesh and then inflating. With the expanding of the wings, in the final development after exposure to the air, the capacity for inflating the frontal sac is lost.

In the experiments, pupæ were buried in 7 inches of sandy garden bed and at a depth of 6 inches in a pasteboard box. Temperature and rainfall were noted during the 18 days of the experiment. In the box experiment, an escape of 38 per cent was noted throughout a period of 16 days, and in the garden experiment 12 per cent during 18 days. The temperature during the 18 days varied from a maximum of 69° to a minimum of 47°.

A number of the flies after emergence from the soil were placed in a bottle without food or moisture, and notwithstanding a temperature of 40° on two of the nights they lived for four days.

The author suggests that the food in the digestive tract of the larvæ may pass on through the pupal period to the fly to "sustain it in the vicissitudes through which it may pass till it feeds."

Studies on the Bionomics of North American Anophelines. Winter Activities of Anophelines in Coastal North Carolina. Marshall C. Balfour. *American Journal of Hygiene*, vol. 8, No. 1, January, 1928, pp. 68–76. (Abstract by A. L. Dopmeyer.)

An account is given of observations made in the coastal area of northeastern North Carolina on the activity of anophelines, between November 1, 1926, and April 30, 1927, together with graphs, tables, and a summary as to the conclusions reached.

The studies are believed to be of interest because they represent more severe winter conditions than were met with when similar studies were made in Georgia, Alabama, and Louisiana.

In Chart I there are plotted against time by months, the following: (1) Adults caught per man-hour; (2) larvæ per 10 square meters; (3) temperature (mean maximum, air; mean, water; and mean minimum, air); (4) inches of rainfall. In Chart II there are plotted against time by months; (1) Adults caught per man-hour; (2) per cent fourth-stage larvæ and pupæ; (3) per cent third-stage larvæ; (4) per cent second-stage larvæ; (5) per cent first-stage larvæ.

Table No. 1 shows anopheline captures and larval identifications according to species, by months; Table No. 2 shows anopheline captures according to resting place; Table No. 3 shows breeding places classified according to type; and Table No. 4 shows breeding places classified according to water surface.

Twenty-first Biennial Report of the North Carolina State Board of Health, July 1, 1924–June 30, 1926. Bureau of Sanitary Engineering and Inspection. Pp. 62–82. (Abstract by J. K. Hoskins.)

The objectives, activities, and accomplishments of the sanitary engineering bureau of the North Carolina State Board of Health are very interestingly presented in this article, illustrated with numerous graphs and charts.

The work of the bureau consists of the following: (1) Sanitary inspection, (2) sanitary engineering, (3) milk sanitation, and (4) shellfish sanitation. The activities of each of these divisions are described and the results obtained are clearly depicted by means of graphs. Particular attention has been paid to the enforcement of the State sanitary privy law. Of a total rural population of 2,389,100 in 1925, 1,149,000, or over 48 per cent, were served by the privy law and public sewerage facilities. Of 184,313 surface privies eliminated since 1919, 66 per cent were replaced by improved types, 7 per cent were supplanted by construction of new sewerage systems, and 27 per cent by extensions to existing sewerage systems. Of the improved types installed, 81.9 per cent were earth pits, 11.8 per cent were septic privies, 4.9 per cent were of box and can system, 1 per cent were concrete vaults, and 0.4 per cent were chemical privies.

The 238 public water supplies, serving 28.37 per cent of the total State population, are under the supervision of the bureau. Of this number, 73 are filtered, 27 are unfiltered surface water supplies, and 138 are unfiltered ground water supplies, serving 573,000, 67,000, and 178,000 persons, respectively. Of the 73 filtered supplies, 38 are under trained operation and laboratory control and serve over 87 per cent of the total population using filtered water.

Improved milk sanitation is reflected in the extent of adoption of the standard milk ordinance. In the total of the 61 cities in the State, each having a population of 2,500 or over in 1920, 31, with a combined population of 401,000, equivalent to 65 per cent of the total State urban population, have enacted this legislation. Milk sanitation ratings of 10 cities, where records for 1924 and 1926 were available, showed an improvement in the efficiency of milk control by the enforcement of the standard milk ordinance, of 18.8 per cent. The average daily milk sales in eight of these cities in which figures were available during this period, increased 8 per cent.

Work in shellfish sanitation has included sanitary surveys of the growing areas, bacteriological examinations of shellfish, and inspection and improvement of shucking houses, all of which has resulted in reestablished public confidence in the safety of these food products.

"Prior to the state-wide activities in sanitation, particularly the enforcement of the sanitary privy law, begun in 1919, the urban rates [typhoid] were 50 per cent greater than the rural rates, and in 1925 the urban rates were only 60 per cent of the rural rates. This changed ratio is almost entirely the result of improved sanitation."

The Washington Suburban Sanitary District. Robert B. Morse. Proceedings of the 32nd Annual Convention of the American Society for Municipal Improvements. Pp. 181–191. (Abstract by J. L. Robertson.)

The Maryland suburbs of Washington lie in two counties. They comprise a large number of small municipalities, several special taxing districts, and numerous incorporated villages. The several water and sewerage systems, in original design, planned only for immediate needs, were inadequate as the demand on the systems increased. Realizing that development of this suburban district could be accomplished only through the installation of adequate water and sewerage systems, and that these must necessarily be under a single administrative body before an effective remedy could be had, action on the part of public-spirited citizens resulted in the report of two investigating committees and the legislative act establishing the Washington Suburban Sanitary District.

A commission of three members administers the affairs of the district. The county commissioners of each county appoint one member, upon recommendation of the State board of health, and the Governor appoints a third, all for four-year terms. The commission has the usual powers with respect to construction and operation of systems, and has power to purchase or condemn all municipal and private systems. Its bond issues must be approved by the public-service commission and its charges and rates are subject to review, upon appeal. Bonds for construction work up to 12 per cent of the assessable basis, may be issued without referendum.

There are two fundamental features of the legislation, one that relieves the towns of their powers and duties with respect to water supply and sewerage, and one that gives the commission the right to raise funds and proceed with all work without referendum.

It was realized that total costs of construction would be far greater than in an ordinary city of equivalent population, on account of the great expanse of territory. In order to distribute the great total cost and maintain equitable costs in proportion with benefits received, it was determined to meet the fixed charges on bonds through a small addition to the tax rate and a front-foot benefit charge on properties abutting on the water and sewer lines, and to cover maintenance and operating expenses on both water and sewer lines by water rates. While it was deemed essential that the rate structure adhere closely to correct theoretical principles, local conditions influenced the relative amounts of the charges.

Here much discussion is given to the front-foot benefit charges, particularly as to construction costs, property classification, assessments for improvements, etc. Also there are given the difficulties experienced and adjustments made by the commission.

Water and sewer house-connections are built to the property line; charges for connections are uniform.

The method employed by the commission to secure payment for construction and operation of the district's water and sewer systems results in a very small annual expense to the property not accessible to them, a larger one to undeveloped land along water and sewer lines, and a still greater one to developed lots receiving service.

Additional interesting notations are made concerning details of the commission's engineering practices.

A Cyanide Citrate Pour Plate Medium for Direct Determination of the Colon-Aerogenes Content of Water and Sewage. Ralph E. Noble. *Journal American Water Works Association*, vol. 19, No. 2, February, 1928, pp. 182–192. (Abstract by J. B. Harrington.)

The cyanide citrate pour plate medium which has been developed for the direct determination of colon-aerogenes is compared briefly with the present standard method as follows: (1) From 42 to 48 hours are required for the cyanide citrate determination as compared with 3 or 4 days' minimum time required for the present standard method; (2) the index by the cyanide citrate method represents more nearly the actual density of the organisms than does the present method; (3) the new method not only enables the colon-aerogenes group to be counted directly, but also indicates the fecal and aerogenes groups reasonably accurately, thereby eliminating the time-consuming Voges-Proskauer reactions; (4) the *B. coli* index by the new plate method is considered dependable. It is superior to that obtained by the lactose broth method and eliminates the difficulties involved in mathematical interpretation. The growth-inhibiting properties of the new medium are believed to be negligible at this time; (5) only the usual standard laboratory equipment is necessary in making the test.

Certain analytical and theoretical data are given for the direct determination of the colon-aerogenes organisms by the cyanide citrate pour method; also tables setting forth the concentration of ingredients.

The colon-aerogenes colonies usually appear on the plates in marked contrast to any of the other forms which may occur. The fecal types appear as small black or dark red disks or as triangular forms, diameter 0.5 mm. The grain types are usually pink, black (blue by reflected light), colorless, or black-sided disks, diameters 0.5 to 4.0 mm.

Comparative tests by the examination of a large number of samples have shown that the *B. coli* index was equal to or exceeded the tube method in 76.7 per cent of the samples and was less than the tube method in 23.3 per cent of the samples.

The cyanide citrate method, although in the experimental stage, is believed capable of being improved to such an extent that it may be of great value in the determination of the colon-aerogenes index of water, sewage, and even of milk.

The Water Resources of Rhode Island. Report of the commission appointed to investigate the sources of water supply for cities and towns, to the General Assembly at the January session, 1928. 126 pages. (Abstract by J. K. Hoskins.)

The report discusses the water resources of the State from the standpoint of the geologist, the chemist, and the engineer. The section on "Geology, Climate and Run-off," by Charles Wilson Brown, reviews the geological formations, the climatic factors, including temperature, precipitation and evaporation, and the run-off, which averages from 50 to 60 per cent of the rainfall.

The quality of the water supplies is ably discussed by Stephen DeM. Gage, under three general classes; namely, surface supplies without purification, used by 33.9 per cent of the entire State population; filtered surface supplies, used by 62.3 per cent, and ground-water supplies, used by 3.8 per cent of the total population. The physical and chemical characteristics and bacterial content of the individual public supplies are given in tabular form. Data concerning disinfection of certain of the public supplies are presented. The sanitary quality of 1,797 rural wells, as disclosed by examination, showed that 52 per cent were safe for domestic use, 23 per cent were doubtful, and 25 per cent were unsafe.

The engineering features such as populations supplied, drainage areas, rivers and streams, water supply developments, etc., are summarized by George H. Leland. Many detailed statistics are presented in the form of tables, including the physical characteristics of each of the public water supplies of the State.

Iron and Manganese Removal at Wausau, Wisconsin. Emil Flatter. *American City*, vol. 38, No. 3, March, 1928, pp. 125–126. (Abstract by C. R. Cox.)

This is a description of a 3–4.5 m. g. iron and manganese removal plant, costing $125,000. Well water of poor physical character is being effectively treated by aeration, coagulation and sedimentation, and filtration. Final chlorination is not needed. The aerator consists of shallow wooden racks, holding 5-inch layers of coke and 2-inch layers of manganese dioxide ore, which are arranged in vertical tiers. The aerated water is dosed with 7.4 g. p. g. alum and 3.5 g. p. g. lime before discharge through a baffled mixing chamber into a 45 by 45 by 16 foot Dorr clarifier, and then into three sedimentation basins, each 36 by 45 by 14 feet in size. Six rapid sand filters are fitted with porous concrete slab underdrains capable of passing 150 g. p. m. per square foot. Slabs are bolted to concrete stringers and have joints cemented. Slabs were made of ¾ to 1 inch gravel. A gravel layer of this size is used over slabs to depth of 6½ inches, then of ⅜ to ⅝ inch size to depth of 3 inches, and then of $\frac{3}{16}$ to ⅜ inch size to depth of 3 inches. Fine sand to depth of 28 inches is placed upon gravel. Complete control and recording apparatus is provided. From 2½ to 3 per cent wash water is used, which is somewhat high because considerable fine floc reaches the filters.

Oil Well Pollution Necessitates Auxiliary Water Supply. C. K. Mathews. *Engineering News-Record*, vol. 100, No. 9, March 1, 1928, pp. 358–360. (Abstract by W. J. Downer.)

Munroe, La., obtained its water supply from the Ouachita River until it became grossly polluted by oil-well wastes a hundred miles distant in another State. The situation was remedied by using the old supply during high dilutions and storing an auxiliary supply in an impounding reservoir for periods of high salt concentrations.

A 6 m. g. d. capacity rapid sand filter, clear well, and elevated tank are being constructed. The old coagulating basin is being remodeled to serve as an aerator for primary alum treatment for taste, odor, and color reduction.

The Treatment of the Water Supply of the City of Columbus, Ohio. Charles Hoover. Proceedings of the American Society of Civil Engineers, vol. 54, No. 2, February, 1928, pp. 471-484. (Abstract by H. M. Freeburn.)

The Columbus water supply is taken from the Scioto River, in which, during a three-day period, turbidity has varied from 22 p. p. m. to 2,250 p. p. m., with a drop of total hardness from 285 p. p. m. to 64 p. p. m. *B. coli* content has at times risen to 100,000 per 100 cubic centimeters.

The river water is pumped to a receiving compartment and divided into two equal parts. One part, without treatment, flows to baffled mixing tanks, while the entire quantities of lime, soda ash, and alum solution are added to the other part, which is then mixed by rotating paddles for 10 minutes. This overtreated portion of water with floc already formed joins other portion of untreated water and the two are passed through baffled mixing tanks having an hour's retention period. Water then flows to six settling basins, two of which must be cleaned every three or four weeks, and others about once or twice a year. Carbon dioxide gas is applied to clear softened water before it passes to filters to neutralize any excess lime, to convert normal carbonate to bicarbonate form, and to prevent after-reactions or deposits in filters or distributing system.

Advantages of lime treatment are as follows: (1) Water safe bacteriologically when sufficient quantity is added to produce caustic alkalinity; (2) increased efficiency of sedimentation; (3) water low in turbidity, color. and organic matter; (4) freedom from objectional gases; (5) lower cost of filtration.

Methods of handling lime, manufacturing alum, and of producing carbon dioxide gas are described. Tabulations show results of operation and quantities and cost of chemicals used.

Making producer gas from coke and burning it under the boilers is perhaps the most economical method of producing carbon dioxide gas. It is possible to produce gas containing 17 to 18 per cent of CO_2, thus requiring an air compressor of only one-fourth the capacity required if coke were burned in open burner.

DEATHS DURING WEEK ENDED MAY 5, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended May 5, 1928, and corresponding week of 1927. (From the Weekly Health Index, May 9, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended May 5, 1928	Corresponding week, 1927
Policies in force	70, 830, 030	67, 576, 686
Number of death claims	14, 992	14, 043
Death claims per 1,000 policies in force, annual rate	11. 1	10. 8

Deaths from all causes in certain large cities of the United States during the week ended May 5, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 9, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended May 5, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended May 5, 1928 [2]
	Total deaths	Death rate [1]		Week ended May 5, 1928	Corresponding week 1927	
Total (66 cities)	8,784	15.5	13.1	976	830	[3] 81
Albany [4]	54	23.5	18.8	3	6	61
Atlanta	100	20.5	12.1	12	5	
White	58		9.8	6	3	
Colored	42	(5)	17.6	6	2	
Baltimore [4]	247	15.6	15.4	26	18	83
White	197		14.1	20	10	80
Colored	50	(5)	22.9	6	8	94
Birmingham	94	22.1	14.1	10	9	86
White	50		10.6	5	3	69
Colored	44	(5)	19.7	5	6	113
Boston	302	19.8	14.0	49	26	136
Bridgeport	35			7	3	128
Buffalo	149	14.0	14.2	17	20	73
Cambridge	40	16.6	7.2	7	2	125
Camden	40	15.4	12.1	10	4	160
Canton	28	12.5	10.1	3	3	71
Chicago [4]	880	14.6	12.1	87	88	75
Cincinnati	169	21.4	17.5	19	6	115
Cleveland	231	12.0	9.6	25	13	68
Columbus	104	18.3	15.0	11	10	103
Dallas	58	13.9	12.1	5	7	
White	44		12.2	5	7	
Colored	14	(5)	11.4	0	0	
Dayton	41	11.6	13.6	4	4	66
Denver	95	16.9	13.3	9	6	
Des Moines	38	13.1	10.5	2	3	33
Detroit	366	13.9	11.9	64	40	90
Duluth	33	14.8	9.5	4	3	93
El Paso	40	21.7	12.9	6	8	
Erie	25			2	3	41
Fall River [4]	34	13.2	13.4	4	5	69
Flint	39	13.7	10.2	11	4	140
Fort Worth	28	8.7	8.9	4	5	
White	22		7.2	3	5	
Colored	6	(5)	21.3	1	0	
Grand Rapids	56	17.8	10.0	3	4	45
Houston	72			10	5	
White	54			7	1	
Colored	18	(5)		3	4	
Indianapolis	109	14.9	15.7	4	7	30
White	91		14.7	3	5	26
Colored	18	(5)	23.3	1	2	61
Jersey City	120	10.3	10.7	15	9	112
Kansas City, Kans	27	11.9	12.9	3	1	63
White	18		10.8	2	0	49
Colored	9	(5)	22.1	1	1	145
Kansas City, Mo	100	13.4	12.1	13	10	92
Knoxville	28	13.9	12.3	3	1	65
White	22		9.9	3	0	73
Colored	6	(5)	29.9	0	1	0
Los Angeles	161			13	26	37
Lowell	45	21.3	13.2	3	2	63
Lynn	24	11.9	13.9	4	0	101
Memphis	51	14.0	18.9	4	8	47
White	24		12.6	2	4	37
Colored	27	(5)	30.4	2	4	63
Milwaukee	167	16.1	12.9	22	19	98
Minneapolis	119	13.6	10.4	18	7	104
Nashville	50	18.9	15.1	5	4	79
White	29		12.7	5	3	107
Colored	21	(5)	21.4	0	1	0
New Bedford	29	12.7	10.0	5	3	108
New Haven	30	8.3	11.8	4	3	56
New Orleans	155	18.9	18.8	13	18	63
White	96		14.6	4	14	29
Colored	59	(5)	30.7	9	4	131

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended May 5, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 9, 1928, issued by the Bureau of Census, Department of Commerce)—Continued

City	Week ended May 5, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended May 5, 1928 [2]
	Total deaths	Death rate [1]		Week ended May 5, 1928	Corresponding week 1927	
New York	1,941	16.9	13.4	223	193	90
Bronx Borough	243	13.3	11.0	24	18	73
Brooklyn Borough	670	15.2	11.8	84	74	84
Manhattan Borough	815	24.3	18.2	96	76	114
Queens Borough	176	10.8	9.6	18	20	72
Richmond Borough	37	12.8	15.3	1	5	18
Newark, N. J	94	10.4	10.7	14	9	72
Oklahoma City	28			2	1	
Omaha	59	13.8	13.1	5	3	58
Paterson	56	20.2	9.4	1	5	17
Philadelphia	603	15.3	12.4	67	38	90
Pittsburgh	216	16.8	16.7	31	44	101
Portland, Oreg	73			3	3	32
Providence	61	11.1	15.1	4	12	35
Richmond	65	17.5	12.5	4	5	52
White	42		9.2	1	2	20
Colored	23	(5)	20.6	3	3	110
Rochester	76	12.1	14.9	7	18	57
St. Louis	265	16.3	12.4	20	17	67
St. Paul	76	15.8	10.6	2	5	19
Salt Lake City [4]	32	12.1	13.8	3	0	49
San Antonio	74	17.7	19.0	17	21	
San Diego	46	20.1	20.4	0	2	0
San Francisco	157	14.0	13.0	2	5	13
Schenectady	21	11.8	9.0	3	2	94
Somerville	23	11.7	13.3	3	3	104
Spokane	27	12.9	12.4	1	4	26
Springfield, Mass	45	15.7	15.6	4	2	63
Syracuse	60	15.7	13.5	7	5	85
Tacoma	16	7.6	13.6	2	1	51
Toledo	91	15.2	14.2	10	8	96
Trenton	44	16.6	16.4	6	3	102
Washington, D. C	138	13.1	15.3	13	16	74
White	85		16.0	6	9	50
Colored	53	(5)	13.0	7	7	129
Waterbury	32			7	4	203
Wilmington, Del	44	17.9	11.1	5	4	132
Worcester	67	17.7	10.1	4	6	49
Yonkers	21	9.1	11.4	2	2	46
Youngstown	37	11.1	15.1	5	6	67

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 65 cities.
[4] Deaths for week ended Friday, May 4, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 12, 1928, and May 14, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 12, 1928, and May 14, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 12, 1928	Week ended May 14, 1927	Week ended May 12, 1928	Week ended May 14, 1927	Week ended May 12, 1928	Week ended May 14, 1927	Week ended May 12, 1928	Week ended May 14, 1927
New England States:								
Maine	4	5	38	32	32	119	0	0
New Hampshire	1				5		0	
Vermont					73	139	0	0
Massachusetts	98	84	66	10	1,002	392	1	2
Rhode Island	4	3	2		221	2	0	0
Connecticut	24	20	71	3	381	58	1	0
Middle Atlantic States:								
New York	324	489	[1] 194	[1] 18	4,021	972	30	9
New Jersey	97	103	40	10	2,114	111	10	1
Pennsylvania	120	164			2,527	692	10	2
East North Central States:								
Ohio	124		229		1,073		14	
Indiana	16	18	56	25	470	187	0	0
Illinois	95	110	95	17	275	1,155	9	11
Michigan	67	104	12	4	1,170	259	4	2
Wisconsin	18	28	838	89	71	457	12	13
West North Central States:								
Minnesota	13	37	22	3	116	108	2	1
Iowa	4				18		1	
Missouri	23	47	65		519	214	17	1
North Dakota	3		55		11	71	0	0
South Dakota	2	1	5	2	29	71	0	0
Nebraska	2	6	3		131	255	0	0
Kansas	7	15	11	3	202	1,029	2	0
South Atlantic States:								
Delaware		2			43	5	0	0
Maryland [2]	30	36	16	19	817	26	0	1
District of Columbia	14	18	4	1	181	5	0	0
Virginia								
West Virginia	9	8	190	5	120	185	3	0
North Carolina	19	10			1,114	1,987	1	1
South Carolina	18	14	419	941	264	411	0	0
Georgia	8	6	86	73	160	83	0	0
Florida	8	12	4	18	101	104	0	0

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 12, 1928, and May 14, 1927—Continued

Division and State	Diphtheria: Week ended May 12, 1928	Diphtheria: Week ended May 14, 1927	Influenza: Week ended May 12, 1928	Influenza: Week ended May 14, 1927	Measles: Week ended May 12, 1928	Measles: Week ended May 14, 1927	Meningococcus meningitis: Week ended May 12, 1928	Meningococcus meningitis: Week ended May 14, 1927
East South Central States:								
Kentucky	4		50		222		0	
Tennessee	6	5	115	36	170	85	1	1
Alabama	13	17	405	21	366	255	0	0
Mississippi	9	5						
West South Central States:								
Arkansas	6		348	53	351	40	0	0
Louisiana	22	21	59	14	237	53	2	0
Oklahoma [3]	20	4	293	42	430	356	1	1
Texas	14		53		194		1	
Mountain States:								
Montana	1	3		1	11	19	1	2
Idaho	1	2			1	25	0	0
Wyoming	1	1			16	108	1	0
Colorado	7	10			20	269	4	0
New Mexico	1	10			184	211	0	0
Arizona	17	3	9		119	147	1	0
Utah [2]	2	7	3			24	2	0
Pacific States:								
Washington	10	9			130	338	1	3
Oregon	3	9	22	17	40	264	0	1
California	83	99	36	20	109	1,523	3	3

Division and State	Poliomyelitis: Week ended May 12, 1928	Poliomyelitis: Week ended May 14, 1927	Scarlet fever: Week ended May 12, 1928	Scarlet fever: Week ended May 14, 1927	Smallpox: Week ended May 12, 1928	Smallpox: Week ended May 14, 1927	Typhoid fever: Week ended May 12, 1928	Typhoid fever: Week ended May 14, 1927
New England States:								
Maine	1	0	20	45	0	0	3	0
New Hampshire	0		12		0		0	
Vermont	1	0	1	7	0	0	0	0
Massachusetts	1	2	242	421	0	0	5	6
Rhode Island	0	0	27	14	0	0	1	0
Connecticut	0	0	98	105	0	0	2	0
Middle Atlantic States:								
New York	4	3	618	971	5	13	10	14
New Jersey	0	0	229	312	2	0	5	4
Pennsylvania	3	1	412	559	0	0	16	16
East North Central States:								
Ohio	1		247		41		9	
Indiana	0	0	99	154	109	134	2	4
Illinois	0	2	239	247	76	26	9	15
Michigan	1	0	318	279	18	42	4	5
Wisconsin	3	3	272	166	5	13	13	6
West North Central States:								
Minnesota	2	0	116	184	0	1	1	1
Iowa	0		50		54		1	
Missouri	0	0	82	91	62	19	8	7
North Dakota	0	0	19	32	0	3	1	1
South Dakota	0	0	33	52	4	13	0	0
Nebraska	0	0	84	31	34	10	1	1
Kansas	0	0	165	104	97	15	6	2
South Atlantic States:								
Delaware	0	0	1	4	0	0	0	0
Maryland [1]	1	0	73	56	0	0	7	5
District of Columbia	2	0	47	25	0	2	1	0
Virginia						4		
West Virginia	0	0	34	89	35	26	7	1
North Carolina	1	0	17	11	46	33	7	11
South Carolina	1	1	8	11	7	21	7	42
Georgia	0	1	22	11	0	27	11	24
Florida	0	1	5	5	8	51	7	21
East South Central States:								
Kentucky	0		64		38		7	
Tennessee	0	0	14	23	23	6	8	18
Alabama	3	0	3	5	5	20	6	24
Mississippi	0	1	5	1	2	45	5	12

[1] Week ended Friday.

[3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 12, 1928, and May 14, 1927—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 12, 1928	Week ended May 14, 1927	Week ended May 12, 1928	Week ended May 14, 1927	Week ended May 12, 1928	Week ended May 14, 1927	Week ended May 12, 1928	Week ended May 14, 1927
West South Central States:								
Arkansas	0	0	14	6	4	0	4	30
Louisiana	0	0	12	4	16	6	15	16
Oklahoma [2]	0	0	61	25	125	31	7	18
Texas	0		66		94		3	
Mountain States:								
Montana	0	0	13	19	19	10	3	0
Idaho	0	0	4	8	6	6	0	0
Wyoming	0	0	31	23	1	2	0	0
Colorado	0	0	66	158	6	13	1	0
New Mexico	0	0	16	11	9	8	1	7
Arizona	0	1	4	34	16	1	0	2
Utah [1]	0	0	3	28	12	1	1	0
Pacific States:								
Washington	0	0	44	40	39	41	1	2
Oregon	1	0	22	22	52	14	3	3
California	7	5	161	213	13	34	18	6

[1] Week ended Friday. [2] Exclusive of Tulsa.

Reports for Week Ended May 5, 1928

DIPHTHERIA

	Cases
District of Columbia	14
Iowa	7

INFLUENZA

District of Columbia	4

MEASLES

District of Columbia	215
Iowa	13

MENINGOCOCCUS MENINGITIS

Iowa	1

SCARLET FEVER

	Cases
District of Columbia	43
Iowa	53

SMALLPOX

District of Columbia	1
Iowa	31

TYPHOID FEVER

Iowa	4

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March, 1928										
Delaware	0	5	2		54		0	22	0	0
Hawaii Territory	2	75	4		14		0	10	0	9
April, 1928										
Connecticut	6	103	47		1,476		0	293	0	6
Nebraska	5	25	423		317		0	413	0	1
North Dakota	19	26	221		38		3	190	8	8

March, 1928

	Cases
Chicken pox:	
Delaware	14
Hawaii Territory	78
Conjunctivitis, follicular:	
Hawaii Territory	114
Dysentery (amebic):	
Hawaii Territory	2
Hookworm disease:	
Hawaii Territory	13
Mumps:	
Delaware	45
Hawaii Territory	47
Tetanus:	
Hawaii Territory	2
Trachoma:	
Hawaii Territory	99
Whooping cough:	
Delaware	5
Hawaii Territory	2

April, 1928

	Cases
Chicken pox:	
Connecticut	318
Nebraska	167
North Dakota	47
Conjunctivitis:	
Connecticut	10
German measles:	
Connecticut	47
Impetigo contagiosa:	
North Dakota	2
Lead poisoning:	
Connecticut	4
Lethargic encephalitis:	
Connecticut	1
North Dakota	3
Mumps:	
Connecticut	895
Nebraska	209
North Dakota	62
Ophthalmia neonatorum:	
North Dakota	1
Rabies in animals:	
Connecticut	2
Septic sore throat:	
Connecticut	6
Nebraska	15
Tetanus:	
Connecticut	1
Trichinosis:	
Connecticut	2
Vincent's angina:	
North Dakota	15
Whooping cough:	
Connecticut	441
Nebraska	27
North Dakota	47

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 99 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,275,000. The estimated population of the 93 cities reporting deaths is more than 30,590,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended April 28, 1928, and April 30, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
42 States	1,305	1,529	
99 cities	773	1,015	843
Measles:			
40 States	17,843	14,735	
99 cities	7,688	3,799	
Poliomyelitis:			
42 States	19	20	
Scarlet fever:			
42 States	3,846	4,536	
99 cities	1,583	2,006	1,271
Smallpox:			
42 States	976	734	
99 cities	152	122	109
Typhoid fever:			
42 States	142	275	
99 cities	26	49	44
Deaths reported			
Influenza and pneumonia:			
93 cities	1,343	926	
Smallpox:			
93 cities	0	0	

City reports for week ended April 28, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine									
Portland	76,400	7	1	0	0	0	6	10	1
New Hampshire									
Concord	[1] 22,546	0	0	0	0	0	1	0	1
Manchester	84,000	0	2	0	0	2	11	0	3
Vermont									
Barre	[1] 10,008	2	1	0	0	0	0	0	0
Burlington	[1] 24,089	0	1	0	0	0	4	0	0
Massachusetts									
Boston	787,000	23	34	19	4	2	229	15	16
Fall River	131,000	2	3	1	2	1	0	1	3
Springfield	145,000	3	2	4	0	0	7	19	4
Worcester	193,000	3	4	17	1	1	51	30	3
Rhode Island									
Pawtucket	71,000	0	1	1	0	0	10	16	2
Providence	275,000	0	8	7	0	0	238	4	4
Connecticut									
Bridgeport	(2)	1	5	8	2	2	9	0	4
Hartford	164,000	5	5	5	0	0	55	15	11
New Haven	182,000	12	2	1	0	0	87	45	11
MIDDLE ATLANTIC									
New York									
Buffalo	544,000	1	9	17	....	0	76	38	20
New York	5,924,000	127	248	226	155	38	1,769	44	346
Rochester	321,000	2	9	1	2	0	37	13	9
Syracuse	185,000	21	4	0	....	0	153	10	14
New Jersey									
Camden	131,000	3	5	10	0	0	81	1	4
Newark	459,000	20	11	23	19	0	302	11	15
Trenton	134,000	1	3	10	0	1	10	4	4
Pennsylvania									
Philadelphia	2,008,000	71	60	51	0	15	1,236	56	49
Pittsburgh	637,000	15	16	14	0	14	143	54	37
Reading	114,000	8	2	1	0	1	16	3	6
EAST NORTH CENTRAL									
Ohio									
Cincinnati	411,000	5	7	10	0	4	56	0	19
Cleveland	960,000	34	23	49	35	2	58	110	22
Columbus	285,000	8	3	3	7	7	79	8	7
Toledo	295,000	20	4	4	12	6	190	9	12
Indiana									
Fort Wayne	99,900	2	2	2	0	0	2	0	4
Indianapolis	367,000	23	3	7	0	1	148	75	26
South Bend	81,700	1	1	2	0	0	1	0	1
Terre Haute	71,900	5	1	0	0	0	0	0	0
Illinois									
Chicago	3,048,000	50	71	83	58	24	33	27	143
Springfield	64,700	11	0	1	2	2	3	8	1

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended April 28, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit	1,290,000	16	47	38	9	7	628	29	54
Flint	136,000	6	3	0	0	0	85	34	8
Grand Rapids	156,000	1	4	2	0	1	16	9	3
Wisconsin:									
Kenosha	52,700	21	1	0	0	0	1	0	0
Milwaukee	517,000	69	12	3	42	5	1	26	36
Racine	69,400	7	2	0	21	1	1	6	2
Superior	[1] 39,671		0						
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	3	0	1	8	3	0	4	2
Minneapolis	434,000	43	14	14	0	6	102	167	9
St. Paul	248,000	13	11	6	0	0	2	23	0
Iowa:									
Davenport	[1] 52,469	1	0	0	0		0	0	
Des Moines	146,000	0	2	0	0		0	0	
Sioux City	78,000	6	1	0	0		5	13	
Waterloo	36,900	16	0	2	0		1	10	
Missouri:									
Kansas City	375,000	13	5	1	0	3	35	82	16
St. Joseph	78,400	0	1	0	0	0	0	7	0
St. Louis	830,000	19	38	17	0	1	357	18	
North Dakota:									
Fargo	[1] 26,403	4	0	0	0	0	0	3	1
Grand Forks	[1] 14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	0	0	0	0		0	0	
Sioux Falls	[1] 30,127	0	0	0	0		1	0	
Nebraska:									
Lincoln	62,000	10	1	2	0	0	0	15	0
Omaha	216,000	3	2	1	0	0	4	0	12
Kansas:									
Topeka	56,500	9	1	0	3	2	6	6	0
Wichita	92,500	24	1	1	0	0	10	5	4
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	0	2	2	0	0	5	8	4
Maryland:									
Baltimore	808,000	48	24	21	20	4	492	21	24
Cumberland	[1] 33,741	1	1	0	1	0	0	0	1
Frederick	[1] 12,035	0	0	0	0	0	33	0	1
District of Columbia:									
Washington	528,000	18	12	17	3	3	168	0	15
Virginia:									
Lynchburg	30,500	0	0	2	0	0	0	1	1
Norfolk	174,000	2	1	0	0	0	62	0	5
Richmond	189,000	2	2	1	0	0	131	0	4
Roanoke	61,900	6	1	0	0	0	23	1	4
West Virginia:									
Charleston	50,700	0	0	0	0	0	2	0	0
Wheeling	[1] 56,208	0	1	2	0	1	3	1	1
North Carolina:									
Raleigh	[1] 30,371	4	0	0	0	1	27	0	2
Wilmington	37,700	7	0	1	0	0	1	0	2
Winston-Salem	71,800	6	0	1	0	0	19	12	11
South Carolina:									
Charleston	74,100	4	0	0	10	1	3	0	4
Columbia	41,800	8	0	0	0	1	0	27	11
Greenville	[1] 27,311	0	0	0	0	0	0	2	0
Georgia:									
Atlanta	(2)	7	1	1	18	3	23	8	5
Brunswick	[1] 16,809	0	0	0	0	0	6	0	0
Savannah	94,900	6	0	0	4	3	0	1	3
Florida:									
Miami	[1] 69,754	26	3	1	1	0	9	21	2
St. Petersburg	[1] 26,847	0	0	0	0	0	0	0	0
Tampa	102,000	4	1	1	0	0	10	14	0

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended April 28, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	0	1	1	0	0	5	0	3
Louisville	311,000		3						
Tennessee:									
Memphis	177,000	3	3	2	0	3	41	9	8
Nashville	137,000	2	1	2	0	2	53	2	4
Alabama:									
Birmingham	211,000	6	1	1	50	2	78	17	12
Mobile	66,800	0	1	1	0	0	3	0	
Montgomery	47,000	2	0	1	0		5	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	1	0	0	0		0	0	
Little Rock	75,900	17	0	0	1	1	7	2	3
Louisiana:									
New Orleans	419,000	2	7	11	11	7	1	0	13
Shreveport	59,500	0	0	0	0	0	13	0	5
Oklahoma:									
Oklahoma City	(2)	2	1	2	11	0	20	5	9
Tulsa	133,000	32	1	0	0		5	29	
Texas:									
Dallas	203,000	10	3	2	1	1	9	1	6
Fort Worth	159,000	16	1	2	1	1	14	3	3
Galveston	49,100	0	0	1	0	0	0	0	4
Houston	[1] 164,954	4	2	6	0	0	58	6	10
San Antonio	205,000	0	1	5	0	0	11	1	5
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	0
Great Falls	[1] 29,883	9	0	0	0	0	1	0	0
Helena	[1] 12,037	0	0	0	0	0	0	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	0	0	0	0	0	0	0	0
Colorado:									
Denver	285,000	40	11	8		4	76	139	6
Pueblo	43,900	7	1	1	0	0	18	1	2
New Mexico:									
Albuquerque	[1] 21,000	4	0	0	0	0	7	0	0
Utah:									
Salt Lake City	133,000	37	3	6	0	1	0	0	4
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle		20	4	2	0		84	15	
Spokane	[1] 109,000	8	2	0	0		0	0	
Tacoma	106,000	6	1	0	0	0	30	51	4
Oregon:									
Portland	[1] 282,383	34	7	1	0	0	32	2	4
California:									
Los Angeles	(2)	84	39	12	17	5	13	57	28
Sacramento	73,400	4	2	2	0	0	5	15	1
San Francisco	567,000	69	19	6	2	0	19	59	4

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended April 28, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	3	0	0	0	2	0	0	0	10	14
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	8
Manchester	3	3	0	0	0	0	0	0	0	0	18
Vermont:											
Barre	1	0	0	0	0	1	0	0	0	0	3
Burlington	1	0	0	0	0	0	0	0	0	0	2
Massachusetts:											
Boston	64	64	0	0	0	11	1	2	1	38	258
Fall River	4	13	0	0	0	0	0	0	0	0	29
Springfield	6	17	0	0	0	1	0	0	0	8	31
Worcester	9	5	0	0	0	3	0	0	0	15	65
Rhode Island:											
Pawtucket	0	0	0	0	0	1	0	0	0	0	17
Providence	9	30	0	0	0	5	1	0	0	1	69
Connecticut:											
Bridgeport	11	7	0	0	0	3	0	0	0	2	42
Hartford	4	2	0	0	0	0	0	0	0	4	46
New Haven	9	2	0	0	0	3	1	0	0	38	56
MIDDLE ATLANTIC											
New York:											
Buffalo	21	43	0	0	0	13	0	0	0	12	160
New York	276	401	0	0	0	113	10	1	0	178	1,764
Rochester	15	10	0	0	0	2	0	0	0	7	83
Syracuse	11	20	0	0	0	5	0	0	0	47	78
New Jersey:											
Camden	6	4	0	0	0	0	0	0	0	1	43
Newark	27	30	0	0	0	4	1	2	0	29	92
Trenton	4	2	0	0	0	1	1	0	0	0	33
Pennsylvania:											
Philadelphia	95	87	0	0	0	47	3	3	1	97	590
Pittsburgh	29	26	0	0	0	12	1	1	0	18	214
Reading	3	17	0	0	0	0	0	0	0	4	33
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	21	37	2	0	0	14	1	1	0	10	160
Cleveland	42	16	0	0	0	20	1	0	0	60	202
Columbus	8	12	1	0	0	4	0	0	0	1	96
Toledo	14	5	2	0	0	5	0	0	0	8	79
Indiana:											
Fort Wayne	5	4	3	0	0	0	0	0	0	2	26
Indianapolis	9	11	11	3	0	4	0	0	1	10	96
South Bend	4	2	0	2	0	0	0	0	0	1	15
Terre Haute	3	1	1	3	0	0	0	0	0	0	-------
Illinois:											
Chicago	117	100	2	2	0	62	2	1	0	141	912
Springfield	3	13	0	10	0	2	0	0	0	3	30
Michigan:											
Detroit	90	119	2	2	0	25	2	0	0	63	342
Flint	6	20	1	21	0	1	0	1	0	7	33
Grand Rapids	7	3	1	0	0	1	0	0	0	6	35
Wisconsin:											
Kenosha	3	1	0	0	0	0	0	0	0	6	5
Milwaukee	27	74	1	0	0	5	0	0	0	11	149
Racine	4	8	1	0	0	1	0	0	0	1	14
Superior	2	-------	1	-------	-------	-------	1	-------	-------	-------	-------
WEST NORTH CENTRAL											
Minnesota:											
Duluth	8	5	1	0	0	2	0	1	0	1	35
Minneapolis	47	21	5	0	0	3	1	0	0	11	103
St. Paul	27	14	4	0	0	0	0	0	0	38	49
Iowa:											
Davenport	1	1	4	0	-------	-------	0	0	-------	0	-------
Des Moines	6	6	2	10	-------	-------	0	0	-------	0	-------
Sioux City	2	1	2	0	-------	-------	0	0	-------	1	-------
Waterloo	1	3	0	2	-------	-------	0	0	-------	2	-------

City reports for week ended April 28, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths all causes
WEST NORTH CENTRAL—con.											
Missouri:											
Kansas City	12	39	2	1	0	11	1	0	0	9	121
St. Joseph	3	9	0	4	0	0	0	0	0	0	...
St. Louis	34	28	4	3	0	15	1	1	1	20	270
North Dakota:											
Fargo	2	4	0	0	0	1	0	1	0	12	10
Grand Forks	1	2	0	0	...	...	0	0	...	0	...
South Dakota:											
Aberdeen	2	0	0	0	...	...	0	0	...	1	...
Sioux Falls	1	9	1	0	...	...	0	0	...	0	5
Nebraska:											
Lincoln	1	0	1	2	0	0	0	0	0	1	24
Omaha	3	4	9	4	0	0	0	0	0	0	52
Kansas:											
Topeka	4	7	1	3	0	0	0	0	0	10	8
Wichita	1	6	0	18	0	1	0	0	0	2	36
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	4	0	0	0	2	0	0	0	3	27
Maryland:											
Baltimore	35	43	1	0	0	20	2	1	1	40	237
Cumberland	0	2	0	0	0	0	0	0	0	0	12
Frederick	0	0	0	0	0	0	0	0	0	0	6
District of Columbia:											
Washington	23	51	1	1	0	10	1	0	0	3	159
Virginia:											
Lynchburg	0	0	0	0	0	0	0	0	0	3	9
Norfolk	0	3	0	2	0	3	0	1	0	4	...
Richmond	1	1	0	0	0	4	1	1	0	2	54
Roanoke	1	0	1	0	0	1	0	0	0	0	17
West Virginia:											
Charleston	2	1	1	0	0	2	0	0	0	1	18
Wheeling	2	1	0	0	0	0	0	0	0	0	10
North Carolina:											
Raleigh	0	0	1	14	0	1	0	0	0	1	15
Wilmington	0	0	0	0	0	0	0	0	0	1	14
Winston-Salem	0	1	5	0	0	1	0	0	0	0	24
South Carolina:											
Charleston	0	1	0	0	0	2	0	0	0	1	22
Columbia	0	0	1	0	0	2	0	0	0	1	42
Greenville	0	3	1	0	0	0	0	0	0	2	5
Georgia:											
Atlanta	4	9	5	0	0	4	1	0	0	4	75
Brunswick	0	0	0	0	0	1	0	0	0	0	3
Savannah	1	2	0	2	0	2	0	0	0	3	37
Florida:											
Miami	0	1	1	0	0	1	0	0	0	0	28
St. Petersburg	1	...	0	...	0	1	0	...	0	...	9
Tampa	0	0	0	0	0	0	1	1	0	0	...
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	4	0	0	0	1	0	0	0	0	17
Louisville	8	...	1	...	...	...	1	...	...	...	...
Tennessee:											
Memphis	5	7	3	1	0	8	1	1	0	3	73
Nashville	2	7	1	12	0	3	0	0	0	6	42
Alabama:											
Birmingham	3	2	7	1	0	4	1	0	0	2	85
Mobile	0	1	1	0	0	3	0	0	0	0	23
Montgomery	1	2	0	0	...	...	0	0	...	0	...

City reports for week ended April 28, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0			0	0		3	
Little Rock	0	5	0	1	0	3	0	0	0	0	
Louisiana:											
New Orleans	5	7	0	0	0	18	2	0	0	4	146
Shreveport	0	0	1	0	0	0	1	0	0	2	34
Oklahoma:											
Oklahoma City	2	8	2	9	0	1	0	0	0	0	33
Tulsa	1	12	2	3			0	0		10	
Texas:											
Dallas	2	11	3	6	0	2	0	0	0	12	40
Fort Worth	1	21	3	5	0	5	1	0	0	0	32
Galveston	0	2	0	0	0	0	0	4	0	0	15
Houston	1	0	1	0	0	5	0	1	1	0	53
San Antonio	1	2	0	0	0	10	1	1	0	0	81
MOUNTAIN											
Montana:											
Billings	2	0	0	1	0	0	0	0	0	1	4
Great Falls	1	0	1	1	0	0	0	0	0	0	10
Helena	1	0	0	1	0	2	0	0	0	0	8
Missoula	1	1	0	0	0	0	0	0	0	0	3
Idaho:											
Boise	1	0	0	0	0	0	0	0	0	0	14
Colorado:											
Denver	11	17	1	0	0	11	0	0	0	28	101
Pueblo	0	1	0	3	0	2	0	0	0	0	20
New Mexico:											
Albuquerque	1	0	0	0	0	2	1	0	0	0	9
Utah:											
Salt Lake City	2	4	1	8	0	4	0	0	0	7	39
Nevada:											
Reno	0	0	0	3	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	8	4	2	2			1	0		5	
Spokane	4	10	5	11			0	0		2	
Tacoma	2	0	4	0	0	0	0	0	0	2	27
Oregon:											
Portland	8	1	6	34	0	1	1	2	0	0	66
California:											
Los Angeles	24	11	5	0	0	28	1	0	0	55	287
Sacramento	1	0	0	1	0	2	1	0	0	0	28
San Francisco	16	18	2	3	0	11	0	0	0	15	170

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis: Cases	Poliomyelitis: Deaths
MIDDLE ATLANTIC									
New York:									
New York	45	18	10	2	0	0	1	0	0
New Jersey:									
Camden	0	0	0	1	0	0	0	0	0
Newark	3	1	2	1	0	0	0	0	0
Pennsylvania:									
Philadelphia	2	1	0	0	0	0	0	0	0
Pittsburgh	2	3	0	3	0	0	0	0	0

City reports for week ended April 28, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	1	1	0	0	0	0	0	0	0
Cleveland	4	1	0	0	0	0	0	0	0
Columbus	2	2	0	0	0	0	0	0	0
Toledo	2	0	0	0	0	0	0	0	0
Indiana:									
Indianapolis	0	1	0	0	0	0	0	0	0
Terre Haute	1	0	0	0	0	0	0	0	0
Illinois:									
Chicago	9	8	0	0	0	0	1	0	0
Michigan:									
Detroit	3	3	0	1	0	0	0	0	0
Wisconsin:									
Milwaukee	1	0	0	0	0	0	1	0	0
WEST NORTH CENTRAL									
Missouri:									
Kansas City	3	1	0	0	0	0	0	0	0
St. Louis	4	2	1	0	0	0	0	0	0
Kansas:									
Topeka	1	1	0	0	0	0	0	0	0
SOUTH ATLANTIC [1]									
Maryland:									
Baltimore	0	0	0	2	0	0	1	0	0
South Carolina:									
Charleston	0	0	0	0	0	2	0	0	0
Georgia:									
Atlanta	0	1	0	0	0	1	0	0	0
Savannah	0	0	0	0	1	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Nashville	1	0	0	0	0	0	0	0	0
Alabama:									
Birmingham	0	0	0	0	1	0	0	0	0
Mobile	0	0	0	0	0	1	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	1	1	0	0	0
Louisiana:									
New Orleans	0	0	0	0	3	1	0	0	0
Shreveport	0	0	0	0	0	1	0	0	0
Oklahoma:									
Oklahoma City	0	0	0	1	0	0	0	0	0
Tulsa	2	0	0	0	0	0	0	0	0
Texas:									
Dallas [2]	0	0	0	1	2	2	0	0	0
Fort Worth	0	0	0	0	0	1	0	0	0
Houston	1	1	0	0	0	0	0	0	0
MOUNTAIN									
Colorado:									
Denver	4	3	0	0	0	0	0	0	0
Pueblo	1	0	0	0	0	0	0	0	0
Utah:									
Salt Lake City	0	0	0	0	0	0	0	1	0
PACIFIC									
Washington:									
Spokane	1	0	0	0	0	0	0	0	0
Tacoma	0	0	0	0	0	0	0	1	1
California:									
Los Angeles	1	1	0	0	0	0	0	1	0
Sacramento	2	2	0	0	0	0	0	0	0
San Francisco	0	0	0	0	0	0	0	1	0

[1] Typhus fever: 1 case at Miami, Fla., and 1 case at Tampa, Fla.
[2] Rabies (in man): 1 death at Dallas, Tex.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended April 28, 1928, compared with those for a like period ended April 30, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, March 25 to April 28, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Mar. 31, 1928	Apr. 2, 1927	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927
101 cities	139	190	132	200	144	174	137	179	[2] 129	171
New England	110	137	126	181	168	105	131	135	133	95
Middle Atlantic	181	263	188	269	209	271	204	270	172	242
East North Central	146	159	121	169	116	135	116	131	[3] 132	137
West North Central	84	158	101	170	101	109	80	141	84	158
South Atlantic	121	157	88	117	82	141	82	135	86	105
East South Central	85	61	25	66	40	86	40	30	[4] 58	76
West South Central	108	178	132	335	160	141	124	124	100	178
Mountain	115	108	44	170	133	108	80	188	133	99
Pacific	74	170	77	125	74	115	102	157	56	188

MEASLES CASE RATES

	Mar. 31, 1928	Apr. 2, 1927	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927
101 cities	1,388	837	1,277	867	1,340	766	1,362	788	[2] 1,285	638
New England	2,014	205	1,874	270	1,726	223	1,743	205	1,593	323
Middle Atlantic	1,491	127	1,504	159	1,739	172	1,824	145	1,862	281
East North Central	1,023	925	1,034	957	998	885	817	797	[3] 731	637
West North Central	748	1,821	762	1,300	861	1,314	986	1,552	1,017	1,225
South Atlantic	2,905	1,091	2,285	936	2,115	1,311	2,358	1,589	1,767	1,017
East South Central	1,696	284	958	608	1,117	396	1,536	517	[4] 1,345	375
West South Central	836	935	436	2,114	428	1,005	380	1,249	396	922
Mountain	752	3,443	708	2,788	743	2,080	761	1,793	840	1,542
Pacific	580	2,761	447	3,051	524	2,207	393	2,103	386	1,528

SCARLET FEVER CASE RATES

	Mar. 31, 1928	Apr. 2, 1927	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927
101 cities	303	440	273	394	226	391	264	362	[2] 265	339
New England	405	530	331	367	301	423	264	346	329	402
Middle Atlantic	398	612	366	594	273	581	287	528	312	446
East North Central	266	329	252	272	194	285	272	298	[3] 277	289
West North Central	257	467	263	433	277	396	288	342	275	333
South Atlantic	221	197	179	177	154	150	170	161	214	191
East South Central	204	172	100	177	234	218	200	167	[4] 167	193
West South Central	144	54	148	99	128	50	164	41	108	33
Mountain	186	1,210	239	941	239	950	212	932	203	950
Pacific	207	340	133	243	123	243	151	209	110	198

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1927 and 1928, respectively.
[2] Superior, Wis., and Louisville, Ky., not included.
[3] Superior, Wis., not included.
[4] Louisville, Ky., not included.

Summary of weekly reports from cities, March 25 to April 28, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SMALLPOX CASE RATES

	Week ended—									
	Mar. 31, 1928	Apr. 2, 1927	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927
101 cities	25	28	18	26	20	24	22	33	[2] 25	21
New England	0	2	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	24	33	24	37	24	32	31	29	[3] 28	33
West North Central	64	30	84	42	49	55	60	40	68	38
South Atlantic	68	61	14	25	11	27	12	65	33	18
East South Central	30	122	10	86	35	96	20	162	[4] 102	66
West South Central	36	62	4	103	16	87	8	95	28	25
Mountain	142	9	106	27	150	27	168	54	150	9
Pacific	23	68	18	55	74	26	59	97	43	65

TYPHOID FEVER CASE RATES

	Mar. 31, 1928	Apr. 2, 1927	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927
101 cities	5	8	4	8	5	8	6	7	[2] 4	8
New England	5	12	2	7	9	9	7	0	5	5
Middle Atlantic	4	6	1	6	5	5	6	7	3	5
East North Central	2	1	3	5	1	1	3	3	[3] 2	6
West North Central	2	2	6	2	8	12	6	4	6	4
South Atlantic	21	16	12	9	4	13	9	11	7	16
East South Central	10	20	15	35	20	35	15	30	[4] 7	30
West South Central	12	25	16	37	20	17	20	12	24	12
Mountain	0	0	0	0	0	9	0	27	0	9
Pacific	3	24	8	8	3	18	3	10	0	15

INFLUENZA DEATH RATES

	Mar. 31, 1928	Apr. 2, 1927	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927
95 cities	29	22	34	23	30	21	28	18	[2] 32	18
New England	11	12	16	7	9	16	7	12	14	7
Middle Atlantic	29	21	31	26	27	21	26	20	34	21
East North Central	24	15	40	9	27	11	28	11	[3] 36	10
West North Central	18	4	16	17	24	12	41	21	31	12
South Atlantic	21	38	19	40	30	38	16	22	30	29
East South Central	78	106	73	74	84	90	68	58	[4] 55	37
West South Central	86	30	107	51	90	42	45	30	37	47
Mountain	53	27	80	36	53	18	53	0	44	9
Pacific	14	24	7	17	14	14	14	10	17	21

PNEUMONIA DEATH RATES

	Mar. 31, 1928	Apr. 2, 1927	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927
95 cities	222	163	215	162	207	153	198	159	[2] 198	143
New England	225	156	179	140	177	156	166	151	138	184
Middle Atlantic	264	186	244	198	243	175	242	199	246	168
East North Central	207	147	241	131	199	141	192	135	[3] 214	128
West North Central	130	93	122	137	175	128	155	124	90	56
South Atlantic	230	225	179	150	209	184	181	179	172	153
East South Central	288	133	397	218	183	138	235	160	[4] 226	133
West South Central	242	161	185	140	238	76	197	81	189	123
Mountain	106	161	97	242	186	152	106	161	106	188
Pacific	118	128	105	117	88	117	81	97	125	117

[2] Superior, Wis., and Louisville, Ky., not included.
[3] Superior, Wis., not included
[4] Louisville, Ky., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31, 657, 000	31, 050, 300	30, 960, 700	30, 369, 500
New England	12	12	2, 274, 400	2, 242, 700	2, 274, 400	2, 242, 700
Middle Atlantic	10	10	10, 732, 400	10, 594, 700	10, 732, 400	10, 594, 700
East North Central	16	16	7, 991, 400	7, 820, 700	7, 991, 400	7, 820, 700
West North Central	12	10	2, 683, 500	2, 634, 500	2, 566, 400	2, 518, 500
South Atlantic	21	21	2, 981, 900	2, 890, 700	2, 981, 900	2, 890, 700
East South Central	7	6	1, 048, 300	1, 028, 300	1, 000, 100	980, 700
West South Central	8	7	1, 307, 600	1, 260, 700	1, 274, 100	1, 227, 800
Mountain	9	9	591, 100	581, 600	591, 100	581, 600
Pacific	6	4	2, 046, 400	1, 996, 400	1, 548, 900	1, 512, 100

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended April 14, 1928.—The following report for the week ended April 14, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.

India.—Bassein, Calcutta, Madras, Negapatam, Rangoon, Tuticorin.
French India.—Pondicherry.
Siam.—Bangkok.
French Indo-China.—Saigon.

SMALLPOX

Egypt.—Alexandria, Suez.
India.—Bombay, Calcutta, Madras, Moulmein. Nagapatam, Rangoon.
French India.—Pondicherry.
Straits Settlements.—Singapore.
Dutch East Indies.—Belawan-Deli, Banjermasin.
China —Canton, Shanghai, Hong Kong.
Japan.- Osaka, Shimonoseki.
Kwantung —Dairen.
South Manchuria.—Changchun.

Returns for the week ended April 14 were not received from Samarinda, Dutch East Indies; Basra, Iraq; or Vladivostok, Union of Soviet Socialist Republics.

CANADA

Provinces—Communicable diseases—Two weeks ended April 21, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven provinces of Canada for the two weeks ended April 21, 1928, as follows:

WEEK ENDED APRIL 14, 1928

	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Influenza	14			3				17
Smallpox				6		2	4	12
Typhoid fever	1		14	5		5	4	29

WEEK ENDED APRIL 21, 1928

	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever				1		3		4
Influenza	15					75		90
Smallpox				18		23	2	43
Typhoid fever		1	16	4	2			23

Quebec—Communicable diseases—Week ended April 28, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended April 28, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	54	Scarlet fever	103
Diphtheria	45	Smallpox	19
German measles	19	Tuberculosis	39
Influenza	3	Typhoid fever	26
Measles	261	Whooping cough	28

CHINA

Hong Kong—Plague—May 4, 1928.—A case of plague was reported in Hong Kong, China, May 4, 1928.

ECUADOR

Duran—Guayaquil—Plague—March, 1928.—During the month of March, 1928, 10 cases of plague with 1 death were reported in Ecuador, of which 4 cases with 1 death occurred at Duran (Eloy Alfaro) and 6 cases at Guayaquil.

Plague-infected rats.—During the same period, of 20,846 rats taken, 21 rats were found plague infected.

Guayaquil—Smallpox.—During the period under report, 24 cases of smallpox with 1 death were reported at Guayaquil.

Esmeraldas Province—Epidemic bacillary dysentery—April 7, 1928.—Bacillary dysentery in epidemic form was reported present in Esmeraldas Province, Ecuador, April 7, 1928.

GERMANY

In German cities the birth, death, and infant mortality rates were all lower in February, 1928, than they were in February, 1927. The following table gives vital statistics for 49 German cities for January and February, 1928, and 46 cities for February, 1927:

	1928—49 cities		February, 1927—46 cities
	January	February	
Marriages	9,657	11,929	10,213
Live births, total	20,401	19,530	18,718
Live births, illegitimate	2,936	2,849	2,875
Deaths, total	18,125	15,800	18,595
Deaths under 1 year of age	2,044	1,888	1,998
Deaths from—			
Tuberculosis	1,529	1,408	1,425
Diseases of respiratory organs	2,443	1,959	3,144
Heart diseases	2,349	2,066	2,195
Rates per 1,000 population:			
Marriages	6.5	8.5	7.8
Births, total	13.7	14.0	14.3
Births, illegitimate	2.0	2.0	2.2
Deaths—			
Total	12.1	11.3	14.2
Tuberculosis	1.02	1.01	1.09
Respiratory organs	1.64	1.40	2.40
Heart disease	1.57	1.48	1.68
Infant mortality	100	97	107

ITALY

Communicable diseases—January 16–29, 1928.—During the two-week period, January 16 to 29, 1928, communicable diseases were reported in the Kingdom of Italy as follows:

Disease	Jan. 16-22, 1928		Jan. 23-29, 1928	
	Cases	Communes affected	Cases	Communes affected
Anthrax	20	16	10	10
Cerebrospinal meningitis	3	3	9	9
Chicken pox	313	122	410	121
Diphtheria	498	287	458	264
Dysentery	4	3	6	4
Lethargic encephalitis	6	6	8	8
Measles	2,380	310	2,896	341
Poliomyelitis	5	5	6	6
Scarlet fever	351	168	353	164
Typhoid fever	368	230	448	229

JAPAN

Tokyo, city and district—Dysentery—January 29–March 24, 1928.—During the eight weeks January 29 to March 24, 1928, dysentery was reported in Tokyo city and district (prefecture) as follows: Tokyo city, cases 186, deaths 62; prefecture, cases 197, deaths 102. Population of city, 1,995,567; population of prefecture, 2,489,577.

SALVADOR

Mortality for January and February, 1928.—During the months of January and February, 1928, the total numbers of deaths occurring in the Republic of Salvador were 3,111 and 2,638, respectively. Population in 1927, 1,688,000.

San Salvador.—During the same period deaths from communicable diseases were reported in the city of San Salvador as follows:

Disease	January, 1928	February, 1928
Gastroenteritis	20	22
Tuberculosis	19	18
Typhoid fever	1	1

Population, 1927: 88,000.

UNION OF SOUTH AFRICA

Orange Free State.—Plague—During the week ended March 24, 1928, two fatal cases of plague, in natives, were reported in the Orange Free State, in Bultfontein area, on a farm.

Plague infection in veldt rodents.—Area of spread.—During the past few months plague infection in veldt rodents is stated to have spread

in the Union of South Africa from the Coega River Valley, in the Uitenhage district, where its existence has been recognized for some years past, eastward as far as the Sundays River Valley, southward throughout the entire Port Elizabeth district and the immediate vicinity of the town of Port Elizabeth, and westward to a point 5 miles east of Thornhill railway station. No definitely plague-infected rodents have been found, but numerous decomposed carcasses of rodents, evidently dead from plague, have been found within 5 miles of the town.

Typhus fever.—During the week ended March 24, 1928, typhus fever was reported in the Cape Province in five districts; in Natal, at Pietermaritzburg municipality, with three cases in Europeans, and present on an estate at Braemar, Umzinto district.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928		
								21	28	4	11	18	25	3	10	17	24	31	7	14	21
China:																					
Amoy	C	28	72	16																	
	D	7	3																		
Canton	C	31	36	14	12	1											1	1			
	D	16	25	14	11	1											1	1			
Foochow	C	P	P	P																	
Hong Kong	C	P	1	P																	
Shanghai (settlement and concession)—																					
Foreigners only	C	1	6	3																	
Including natives	D	20	74	7																	
Swatow	C	42	P	P	P																
	D		P	P	P																
Tientsin	C	P	15	2	P	1															
Dutch East Indies: Java—Batavia	C				28	3															
	D				18	3															
India	C	45,163	31,390	20,160	23,047	25,139	15,377	3,267	3,097	3,026	3,001	2,865	3,047	3,256							
	D	22,051	15,895	10,371	12,863	15,026	8,863	1,765	1,739	1,684	1,562	1,529	1,686	1,755							
Bassein	D									1			1	1			4	25	22	20	6
Bombay	C	42	3		2				1						1	1					
	D	30	2		2										1	1					
Calcutta	C	87	76	101	199	428	176	39	36	70	58		80	99	162	164	190	148			
	D	40	39	64	138	281	125	18	24	38	32	35	42	63	101	94	122	114	112	111	97
Madras	C	547	59	14	13	1	1	1			1		3	11			7	1	2		
	D	278	48	8	7	2	1		3		1	2	2	7	7		2	1	1	4	5
Madras Presidency	C	7,660	3,056	2,050	3,073	3,702	1,364	1,163	1,301	1,305	912	930	839	621							
	D	3,513	1,581	1,055	1,736	2,104	984	623	813	726	498	504	457	357							
Negapatam	C							4													
	D							4	1		1	2	2							1	
Rangoon	C	1	2	6	2	8	4	4		1	1	10	12	3	4	4	7	8			
	D	1	2	5	5	6	3			1	1	8	4	2	4	2	3	6	5	2	7
Tuticorin	C			1		8													10	43	45
	D			1	37	14										1			8	26	32

India (French):																					
Chandernagor	C	1	1		6	10	14	1		5		2	2		1	2					
	D	1			6	10	9			1		2	2		1	1					
Karikal	C	18	1		1	1	8	9	7	8	8	2	2	2							
	D	12	1		1	1	4	5	4	5	5	2	1	2							
Pondicherry	C	12	15		1	25	11	2	3	2	5	17	10	6					1	2	3
	D	11	15		1	21	12	2	3	2	3	12	4	3					1	2	3
Indo-China: [1] Saigon	C		1	1			3	1	1		2	1	5	2	8	27	13	21	35	50	28
	D						1				1	1	1		6	19	8	12	20	37	17
Iraq [2]																					
Kwangchow-wan [1]																					
Philippine Islands: Manila	C	1																			
Siam	C	77	40	18	110	88	110	50	33	48	69	74	59	84	78	53	88			24	
	D	53	24	11	76	64	80	34	21	42	42	50	38	73	53	39	67			17	
Bangkok	C	2	3	5	4	3	21	11	28	28	34	23	17	12	8	8	12	16	24		30
	D	1	1	3	2	2	11	7	16	26	17	12	11	7	6	5	5	12	11		13
Straits Settlements: Singapore	C				7	5	23	2			1					1					
	D				5	4	12	1								1					
On vessel:																					
S. S. Adrastus: At Yokohama, Japan	C	1																			
	D	1																			
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C																		P		
S. S. Tabaristan: At Basra, Iraq	C			1																	

[1] See 10-day table below.
[2] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

Place		July-September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928			March, 1928			April, 1928
				1-10	1-10	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	1-10
Indo-China (French):																			
Annam	C	3,179	226	13	75	38	[illegible]	2		79	95	93	23	36	14	18	18	23	17
Cambodia	C	251	180	56	1	28	21	12	39	30	9	15	38	22	51	33	22	92	43
Cochin-China	C	469	178	21	27	52	17	38	33	46	119	130	178	113	153	206	217	245	277
Laos	C	246	67	10															
Tonkin	C	1,297	1			1			2	1									
Kwangchow-Wan	C	16																	1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	April, 1928: 7	April, 1928: 14	April, 1928: 21	April, 1928: 28	May 4, 1928
Algeria:[1] Oran	C	1		2																		
	D	1																				
Arabia: Aden	C					19	13	22	54	89	63	45	77	158	189	148	151	163	108	59		
	D					7	8	8	33	55	50	31	26	99	134	135	134	126	97	48		
Argentina:																						
Bahia Blanca district	C				3																	
Buenos Aires	C									2												
Cordoba Province	C		P	P	10	2																
Firmat	C				1																	
Quilino	C				3																	
Rosario	C				4	5		4			1											
Santiago Province	C										1											
Ucacha	C				1																	
Azores: St. Michaels Island	C	2	3	3	3	2	3	1	2	2	1	1	1		1							
	D	1	1		1	1	1	1	1	1			1		1							
Brazil:																						
Bahia	C					4	2		2	1	4	4					P	2				
	D					4		1	2	1	2	3										
Porto Alegre	C												2									
Rio de Janeiro	C						1		1	2	1	1		1	2							
	D									1	2				2							
British East Africa:[1]																						
Tanganyiki	C		P	P	P	P			2				3									
	D								2				3									
Uganda	C	226	99	99	67	79	16			7	13											
	D	158	88	96	61	64	12			6	10											
Canary Islands:																						
Las Palmas	C		9		3	3	1				1				2		2					
	D				1	1	1				1											
Teneriffe	C						1	3	3	3												
	D						1		3													
Ceylon: Colombo	C	3	1		6	7	1	1	1		3	3	4	1	3		4					
	D	3			6	6	1	1			1	3	1	1	3		2					

Chi[illegible]																						
[illegible]	C																					
Tungliao	D		200																			
Dutch East Indies:																						
Balik-Papan	C					1																
	D					1																
Celebes—Makassar	C			6	2	6	2	1	1	1		1										
	D			6	2	5	2	1	1	1		1										
Java	D	432	779	829	1,017	751	197	214														
Batavia and West Java	C	68	130	132	154	128	46	37	27	27	31	15	24	33	19							
	D	68	129	132	152	128	44	37	27	27	31	15	24	33	19							
Cheribon	C				1																	
	D				1																	
East Java and Madura	C	18	17	10	8	7	5	2					1									
	D	18	17	10	8	7	5	2					1									
Pasoeroean Residency	C				P																	
Surabaya Residency	C				P												1					
	D																1					
Surakarta Residency	C			P	P																	
Ecuador: Guayaquil [1]																						
Egypt:																						
Alexandria	C	1			12	5			1		1											
	D				7	2			1		1											
Beni-Souef	C																				4	
	D																				1	
Cairo	C					2																
	D					2																
Maghagha District	C																					
	D																			1		
Minieh Province	C																			32	9	
	D																			5	4	
Suez	C	1				1	1		3		3	4	3	3		4	7	3		3		
	D					1	1		1		3	3	2	1		2	3	4		2	2	
Greece:																						
Athens and Piræus	C	3	1			3																
	D		1			1																
Mitylene	C	5	1	3	3																	
Patras	C	2	1	1																		
	D		1	1																		
Hawaii Territory: Hawaii	D										1											
India	C	2,710	3,248	3,600	5,518	7,097	2,[illegible]44	2,699	3,601	3,803	5,188	5,776	6,136									
	D	1,428	1,792	2,065	3,269	4,925	1,653	1,661	2,577	2,630	3,585	3,999	4,828									
Bassein	D	14	8	4	4	17	3	3		2	1	2	4	5	5	5	7	5	4	5		
Bombay	C	7	4			3	5	4	2	3	5	14	7	7	4	16						
	D	5	3			3	2	2	3	2	6	14	7	6	4	11	25	21	15	14		
Calcutta	C	18				2																
	D	10						1											2			
Madras Presidency	C	465	583	470	791	550	107	132	79	134	142	112	64	53								
	D	230	298	282	359	206	63	64	60	69	79	72	34	27								
Rangoon	C	6	11	11	15	17	8	9	7	11	15	16	6	11	5	11	3					
	D	6	11	11	15	16	7	7	6	10	12	15	6	10	4	9	5	8	5	1		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	April, 1928: 7	April, 1928: 14	April, 1928: 21	April, 1928: 28	May 4, 1928
Indo-China:[1] Saigon	C	2		1																		
Iraq:																						
Baghdad	C						1	1		2		1	1		2		1		1	4		
	D						1			1		1	1		2	1	1		1			
Dulaim Liwa	C								1													
Kwangchow-Wan[1]																						
Madagascar[1]																						
Mauritius[1]																						
Nigeria:[1] Lagos	C			17	13	10	2	3	3	2	2	3	2	1	2		2	3	2			
	D			17	13	8	3	3	3	2	2	3	2	1	2		2	3	1			
Peru[1]																						
Senegal:[2]																						
Baol	C	72	95	P	P																	
	D	33	40																			
Cayor	C	463	176	48																		
	D	233	88	28																		
Dakar	C	20	1																			
	D	12																				
Louga	C	5	8																			
	D	4																				
Rufisque	C	16																				
	D	12																				
Thies and vicinity	C	9	1	1													8					
	D	7															4					
Siam	C		13	1	3	16	5	3	6	6	13	4	11	14	7	8				11		
	D		9		2	11	1	1	5	5	10	4	10	12	6	9						
Bangkok	C		2			1		1	1		1						1					
	D			1		1		1	1		1						1					
Straits Settlements: Singapore	C			1						1	1	1		1		1						
	D			1						1	1	1				1						
Syria[1]																						
Tunisia[3]																						
Turkey: Constantinople	C	1	1		2																	
	D		1		1																	

Union of South Africa:																						
Cape Province	C			2	2		1															
	D			2	1		1															
Orange Free State	C			1	8			2		3	4	1			3	2						
	D			1	6			1		3	1				3	2						
U. S. S. R.:																						
Chita district	C		1																			
	D		1																			
Northern Caucasus	C	14	1																			
	D	10																				
Venezuela: State of Miranda—Tacata and Cua	C													P								
On vessel:																						
At La Plata, from Rosario, Argentina	C					1																
S. S. Aghios Gerasimos, at Vigo, Spain	C			3																		

[1] See monthly table below.
[2] During January, 1928, 5 cases of plague were reported in interior of Senegal; 17 cases with 13 deaths during last 2 weeks in February; 8 cases and 4 deaths, Mar. 11 to 20, 1928.
[3] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Algeria: Algiers	C		2				
Angola	C		3				
British East Africa: Kenya	C	95	62	26	24		
Ecuador: Guayaquil	C	15	18	4	6	10	
	D		5	4	3	1	
Indo-China (French)	C	14	10	7		5	4
Kwangchow-wan						18	
Madagascar	C	314	692	427	342		
	D	286	605	388	317		
Ambositra Province	C	7	25	105	67		
	D	7	17	96	66		
Antsirabe Province	C	39	109	117	108		
	D	38	108	117	108		
Itasy Province	C	36	104	33	19		
	D	41	94	29	17		

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Madagascar—Continued.							
Moramanga Province	C	12	95	19	25		
	D	12	83	19	24		
Tananarive Province	C	211	408	155	123		
	D	189	354	129	102		
Mauritius	C	1					
Nigeria	C	32	63	16	16		
	D	29	61	16	16		
Peru	C	34	34		41		
	D	19	11		14		
Callao	D	3	3				
Lima	C		7				
	D		3				
Senegal	C						52
	D						32
Syria: Beirut	C		2				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928			
								21	28	4	11	18	25	3	10	17	24	31	7	14	21	28
Algeria [1]	C	459	382	683	661	170	129	17	18	20	16	30		28	14	3				12		
Algiers	C					3	9	3	1	7	4	4		5	1		2	2	1			
Oran	C	9	16	11	20	39	29	2	2	4	3	1		2	2		2	10		3		
Angola. [1]																						
Arabia: Aden	C				1	3	1					1										
Brazil: [1]																						
Para	C	1																				
Rio de Janeiro	C	6	10		1																	
	D	4	9		1											1						
British East Africa: [1]																						
Kenya—Mombasa	C																1					
Tanganyiki	D	21	8	P	P	P	8	4	0	1												
British South Africa.																						
Northern Rhodesia	C	55	39	164	185	252	236	3		230		79	117	38	63		54	8				
	D	1	2	11	64	62	31			23		5	32	2	3		9					
Southern Rhodesia	C				3	2	1			P	3	2	4	P	3	4	1	2				
	D												1									
Canada:																						
Alberta	C	17	17	23	10	10	11	1	19	1	6		3		7	7	20	7	13	4	2	3
Calgary	C	1														1						
Edmonton	C			1	1	8	5	1			2	1		11	1	1	11	1	7	2		
British Columbia: Vancouver	C		2			4	8	11	3	1	11	2	1	3	4	2	5	6	4	11		
Manitoba	C	13	9	7	19	7	11		1													
Winnipeg	C	5	4	2	2	2	2	1	1													
New Brunswick	C						1						1									
Nova Scotia	C		2	1																		
Halifax	C		1	1																		
Ontario	C	60	22	96	264	347	212	52	77	63	51	40	51	36	20	19	35	20	9	6	18	18
Hamilton	C					2										2						
Kingston	C				1		1				1									2		1
Ottawa	C	27	40	67	134	63	60	20	16	23	9	11	3	1	7	6	8	10	2		3	1
Toronto	C		2	10	34	39	28	8	5	1	6	4	4	2	4	2	3	3	1	2	4	4
Windsor	C			9																		

Montreal	C				1		8	3	4	1		5	1	3		6	3				6	2
Quebec	C					4	5		5				2	5	4	3	4	4	5	4		
Riviere du Loup	C				3																	
Sherbrooke	C																	3				
atchewan	C	14	68	31	34	58	52	39	15	9	34	7	8		7	14	7		19	2	23	15
Moose Jaw	C	10	16	3		1	4	4	2	3	2		2	6	5	2	5			3		
Regina	C	8		5	1	1												1	2	3	2	
Saskatoon	C					2	4	13	1		1		2									
Ceylon: Colombo	C	1			1	2		1		1	2	2	1	3					1			
	D	1				1		1									1					
China:																						
Amoy	C														1	1	2	1				
Antung	C						1														1	
Canton	C		1												2	3	2		2	1		
	D		1																			
Chefoo	C		1	P		P										P						
	D		1											1								
Foochow	C	P	P	P	P	P	P		P		P		P		P							
Hong Kong	C	1	2				1	1		1		1	3		3	5	7	10	10	4	4	
	D	1	2				1		1	1			1	1	2		2	5	12	7	2	
Manchuria—																						
Changchun	C					1			4											2		
Dairen	C			1	2	1	5	1		5	9	3	4	6				4	6	7	3	
	D			1					1	2	5	4	2	1								
Fushun	C		1		1																	
Harbin	C					2	1		2	1	2	2	1	3	1	2	3					
Mukden	C			2	1				1		3	18		3				1			3	
Pensihu	C			1																		
Shanghai—																						
Foreigners only	C							1	2		2	1	1	1	3	1	1	3	2			
Including natives	D							3	2	3	3	5	4	4	6	2	1	3	3	3	1	
Tientsin	C		4	13	8	9	8	20	10	10	8	5	2	2	11	4						
Chosen																						
Curacao (alastrim)	C							2				3										
Dominican Republic: Santo Domingo	C															2						
Dutch East Indies:																						
Borneo—																						
Pontianak	C												1									
Samarinda district	C				P																	
South and East Borneo Residency	C	P																				
Java—																						
Batavia and West Java	C	4		4	25					1	3		1		1	4						
	D				15																	
East Java and Madura	C	4	22	8	9	9	5	2						8								
	D			1																		
Sumatra—Medan	C					3	9	3	5	5	10	7	3	1	3	6						
	D					2	3	4	4		3				2	4						
Ecuador																						

e 10-day and monthly tables below.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928			
								21	28	4	11	18	25	3	10	17	24	31	7	14	21	28
Egypt	C		8			4	4				1		1	1					52	11		
	D		1	1		1													33	6		
Cairo	C					2																
France [1]																						
Gold Coast [1]																						
Great Britain:																						
England and Wales	C	568	508	473	902	1,041	1,175	405	370	386	369	369	392	365	347	359	342	322	318	321	326	
Birmingham	C	1		1				14	17	11	2	1		2		1				1		
Bradford	C				11	19	32	6	9	7	2	7	1		4	9		5	5	3	2	
Bristol	C			6	4	8			2		1			1	3		2	8	2	1	10	
Cardiff	C				1		1											5				
Leeds	C	5	3	7	5	16	11	1			2	1	2	4	2	3	5	3	3	2	2	
Liverpool	C						1								1							
London	C							2		1	1	10	1	2	1	10	5	1	1	7	5	
Manchester	C			3	6	25	5	11	6	4	4	1	4	1	2	4	3	3	4	2	4	
Newcastle on Tyne	C	1	2	6	9	55	22	14	3	4	6	4	1	4	3	3	4		2			
Nottingham	C						13	4	8	6	9	6	1	3	1	5	1	6	1	4	4	
Sheffield	C	2	1	10	6	9	14	4		4		1	2	2	1				1		10	
Stoke on Trent	C	1					4			1		2	4	3	6	11			1	4	10	
Greece: [1] Saloniki	D	2																				
India	C	5,911	4,398	3,153	4,052	6,731	10,676	4,129	3,631	5,159	4,858	4,567	4,220	5,251								
	D	1,668	1,120	715	927	1,650	2,429	964	803	988	954	1,073	938	949								
Bassein	C	1									1											
	D	1																				
Bombay	C	33	12	10	4	9	14	10	23	10	18	29	23	46	51	49	58	62	49	56	57	
	D	19	8	2	3	2		2	8	7	7	15	13	23	22	24	33	36	27	32	34	
Calcutta	C	27	22	5	5	25	36	14	11	23	10	9	18	14	30	20	29	45	40	49	51	
	D	25		6	2	11	27	10	7	10	7	5	11	10	24	15	21	33	35	32	42	
Karachi	C														1	1						
	D														1							
Madras	C	6	7	8	7	11	21	9	16	20	29	15	33	21	31	30	27	45	81	49	36	
	D		2		2	3	6	3	2	2	1	3	3	3	10	5	3	6	15	16	8	
Negapatam	C	8	1				5		4	2	2	1		1	1					1		
	D	2	1				3		2	1										1		

ngoon	C	14	9	17	6	14	136	41	34	103	97	68	82	132	95	96	82	92	50	62	45
	D	3	2	3	1	4	31	13	10	18	23	22	24	26	32	28	17	34	23	24	17
Vizagapatam	C		3				3	2	1	5	2		1		1			3			2
	D		2					6	1		1										
India (French):																					
Karikal	C	3	1	2	P																
	D	3	1	2																	
Pondicherry	C	39	37	38	42	41	65	15	17	15				6	3		6	5	7	12	
	D	31	37	38	42	41	50	15	17	15				6	3		6	5	7	12	
Indo-China: [1] Saigon	C	1	1			1	3						2		1						
Iraq:																					
Baghdad	C		1	7	5	25	23	7	6	3	3	2		3	2	3	1				
	D		1	4	4	14	12	3	5	2	1	1		1	2	3	1				
sra	C	1	4	2	3	4	2	1				1		2	4	4	1				
	D	1	4	2	1	3	1									1	1				
ghorn	C													1		1					
lermo	C																	3	2	1	3
Rome and vicinity	C		1					2													
Jamaica (outside Kingston) (alastrim)	C	6	9	9	7	3	2		4	1		1	3		6	3	2				
Kingston (alastrim)	C		3	2																	
Japan:																					
Nagasaki	C	2																			
	D	1																			
Tokyo	C							2	1		1		1		3	1	3				
	D								1					1	1						
Tokyo Prefecture	C																17				
Latvia [1]																					
Mauretania	C											P	P								
Mexico [1]																					
Acapulco	C		2		1																
	D		2		1																
Chihuahua	D						1														
Jalisco (State)	C																		P		
Guadalajara	D					2								1					2	2	1
Manzanillo	D						1									1					
Mexico City and surrounding territory	C					4				1	1	2									
San Luis Potosi	D	1																			
Tampico	C												1								
Torreon	D	1		2																	
Morocco [1]																					
Nigeria [1] Southern Province	C													7			40	26			
Palestine. Jerusalem	C					1			1								28	1			
	D								1												
Persia [1]																					
Poland	C	2				1	6	1	1	1		1				1					
	D	1																			
Porto Rico [2]																					

[1] See 10-day and monthly tables below.

[2] The report of the presence of smallpox in the vicinity of Fajardo, Porto Rico, which has appeared in the Public Health Reports, was erroneous. No smallpox has been reported to Rico for several years.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov 19, 1927	Nov. 20–Dec 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928 21	28	February, 1928 4	11	18	25	March, 1928 3	10	17	24	31	April, 1928 7	14	21	28
Portugal: [1]																						
Lisbon	C		3	8	4	10	12	5	2	2	3	3	9	4	4		2	3				
	D					1																
Oporto	C		1																			
Senegal: Dakar	C												8		28	17						
	D															12						
Siam	C	51	27	6	1	9	23	13	7	5	10	1	7	1	3		2	3				
	D	10	15			1	2	1	1	2		1	1		1			2				
Bangkok	C		3		1	1	3															
	D		1				1															
Spain: [1]																						
Malaga	D				1	1																
Seville	C						1															
Valencia	C			1			2								1		1	1				
Straits Settlements: Singapore	C				1					1		1				1						
Switzerland	C						2															
Syria [1]																						
Tunisia: Tunis	C						4		3			2	4	2	6	1			1	2		
Union of South Africa:																						
Cape Province	C	P		P				P			P											
Natal	C										P	P			P							
Orange Free State	C	P			P	P	P	P			P											
Transvaal	C			P	7																	
Upper Volta	C											2	3				2			P		
Union of Soviet Socialist Republics [1]																						
Venezuela. Maracaibo	D		2	1							1				1							
On vessel: S. S. Arendskerk at Singapore from Amoy, China	C																	P				

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927	December, 1927			January, 1928			February, 1928			March, 1928			Apr. 1-10, 1928
							1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	
Algeria	C	376	459	382	682														
Oran	C	14	10	16	11														
Indo-China (French)	C	19	3	21	25	88	10	4	20		40	18	50	31	90	57	71	69	
Syria:																			
Aleppo	C								1		1								
Beirut	C						1		1			15	11	26		12	7	4	3
	D																	2	1
Damascus	C		3	5	22	13	4	6	2	11	2						1		

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Angola	C	51	73	71	7	10		
	D		2					
Congo	C	5	77					
Cuanza-Norte	C	1						
Cuanza-Sul	C		2		7	10		
Loanda	C	1						
Zaire	C	3	4	1				
Brazil: Porto Alegre	C	11	4	1			1	
British East Africa: Zanzibar	C		2					
	D		1					
Chosen	C	21	2	2		4	21	
	D	6		1		2	8	
Ecuador: Guayaquil	C	4	1	1	4	2	9	24
	D							1
France	C	37	7	4	14	11	10	13
Gold Coast	C	7	4				1	
Greece	C	10	4		5	6	11	19
	D						2	2
Latvia	C		2				1	
Mexico	D	221	132	157				
Morocco	C	180	81	140	401	55	47	30
Nigeria	C	820	223	93		275		
	D	173	51	30		39		
Persia	D			2		7		
Portugal	C					143	115	
	D					22	8	
Spain: Madrid	D			1				
U. S. S. R.:								
Railways, etc.	C	26	7	11	15	18		
Other territories in Europe	C	366	220	471	565			
Transcaucasus, Siberia, and Central Asia	C	80	40	21	20			
Ukraine	C	27	11	20	17	6		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C, indicates cases; D, death; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928		
								21	28	4	11	18	25	3	10	17	24	31	7	14	21
Algeria: [1]																					
Algiers	C								1					1	2	1	1	2	5	1	
	D													1							
Oran	C						4		2			2	1	6	1	1		2	1	1	
Argentina [1]																					
Austria: Vienna	C									1											
Bulgaria: [1] Sofia	C			17	6	1	6	1								3		3	14		
	D				1																
Chile:																					
Antofagasta	D			1																	
Talcahuano	D		1														1				
Valparaiso	C		1		1	2	1							1							
	D	2	1		2																
China: [1]																					
Manchuria—																					
Dairen	C																			7	
Harbin	C	2			1																
Tientsin	C		2																		
Chosen [1]																					
Czechoslovakia [1]																					
Egypt	C	2		12	4	14	8	2	6		1		13	3	1		1	1		2	1
	D	3		5		8	4		2				5	3			1				
Cairo	C					3															
	D					3															
Port Said	C			1		1															
Greece [1]																					
Ireland (Irish Free State)	C									1										1	
Cork County	C					3	1														
Donegal County, Letterkenny	C			4																	
Japan [1]																					
Latvia [1]																					
Lithuania [1]																					

Mexico:																					
Guadalajara	D					1															
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	15	2	1		2	1		4	3	6	6				
	D				2	1	5							3	1		3				
Monterey	D																1				
Morocco [1]	C						342	257	214	370	210	141			175	172	167	219	190	186	
Palestine	C	11	1	5	3	9	8		2	2	1	1	2	6	1	5			2	3	
Peru [1]																					
Poland	C	50	35	19	64	93	195	101	92	87	66	57	62	57	89	90	90	125			
	D	6	2	4	11	10	16	4	3	5	7	10	3	7	6	5	6	7			
Portugal: [1] Oporto	C	1			1						1										
Rumania	C	36	16	17	22	35	68			15	24		14	26	28	29					
	D	1		2			3			2	7			4	1	2					
Syria: [1] Aleppo	C		2				2														
Tunisia	C	14		3	1	1	6	4				1				13		5			1
Union of South Africa:																					
Cape Province	C	P	P	P	P	P	1	P	P	1	P	P	P				P				
Natal	C	P	P	P	P	2	3		P		1	P	P			P	P				
Orange Free State	C			P		P				P	P	P	P				P				
Transvaal	C	1		5	P	P											P				
U. S. S. R. [1]																					
Yugoslavia [1]																					
On vessel. S. S. Gaika at Durban, Natal—from Mauritius	C													1							

[1] See 10-day and monthly tables below.

Place		1927				November, 1927			December, 1927			January, 1928			February, 1928		
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Algeria	C	67	33	10	12												
	D	13			1												
Algiers	C	2	2	6	2												
Bulgaria	C	12	24	7	2						2	7	6		8	12	6
	D		1	2	1						1		1		1	2	2
Morocco	C	148	76	7	11	5	14	7	5	6	75						

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C, indicates cases; D, death; P, present]

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Argentina: Rosario	C			1				
	D				1	1		
China: Shanghai	D			1				
Chosen	C	90	16	26	38	183	400	
	D	8	1	2	3	19	44	
Chemulpo	C	3				1		
Gensan	C	2				1		
	D					1		
Seoul	C	5	2					
	D	1	1					
Czechoslovakia	C	12	1		6			2
Greece: Athens	C	3			1	2	2	
Japan	C	1		1				
Latvia	C	6					1	
Lithuania	C	69	9	18	27	86	137	
	D	14	1	1	1	10	12	

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Mexico	D	64	36	29				
Peru:								
Arequipa	D	3	2		1	2		
La Oroya	C					P	P	P
Lima	C	8						
Turkey	C						17	
	D						1	
U. S. S. R.:								
Railways, etc.	C	77	23	33	46	41		
Transcaucasus, Siberia, and Central Asia	C	208	61	49	80	7		
Ukraine	C	295	151	198	282	533		
Other territories in Europe	C	1,839	521		1,403			
Yugoslavia	C	20	1	1		7	24	3
	D	5				3		

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3–30, 1927	July 31–Aug. 27, 1927	Aug. 28–Sept 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
Belgian Congo:																				
Boma	C											3								
	D											2								
Matadi	C											8	12	11	1	5	8			1
	D											2	6	8	2	5	6			
Dahomey:																				
Grand Popo	C						1													
	D						1													
Porto Novo	C	1																		
	D	1																		
Gold Coast:[1]																				
Ashanti Obuasi	C		1																	
	D		1																	
Ivory Coast	C	1									1									
	D	1									1									
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	38														
	D	3	9	21	31	28														
Dakar	C	1			12	14	2	1	4			1	1							
	D				7	10	2	1	4			1	1							
Togoland	C		1																	
	D		1																	

[1] See monthly table below.

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 43 :: :: NUMBER 21

MAY 25 - - - - 1928

SPECIAL ARTICLES

Sex Differences in Disease Incidence According to Age

Statistics of Admissions to Hospitals for the Insane

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

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CONTENTS

PUBLIC HEALTH REPORTS

VOL. 43 MAY 25, 1928 NO. 21

SEX DIFFERENCES IN THE INCIDENCE OF CERTAIN DISEASES AT DIFFERENT AGES[1]

Hagerstown Morbidity Studies No. IX[2]

By Edgar Sydenstricker, *Statistician, United States Public Health Service*

The present paper is, in a sense, a continuation of the reports on "The Illness Rate among Males and Females," and on "The Incidence of Various Diseases According to Age," previously published, since its purpose is to present the results of the Hagerstown morbidity study bearing on the incidence of certain diseases as manifested in illness among males and females at different age periods.

Since the scope and method of the study in which the basic data were obtained have been set forth at considerable length in the first paper of this series, and since especial reference may be made to the two papers mentioned above, it will not be necessary to repeat what already has been said. The comparability of the records for males and females is so essential, however, to whatever observations may be made in this paper that the question ought to be given rather careful consideration before presenting the data and in discussing the results of the study.

As was stated in the first paper of this series, the record of illness in our study was furnished by an adult member—usually the mother of the family—of each household visited. Might not this fact mean that a more complete record of illnesses, particularly the minor

[1] From the Office of Statistical Investigations, U. S. Public Health Service.

[2] Other Hagerstown morbidity studies published are—

I. A Study of Illness in a General Population Group. Method of Study and General Results. Pub. Health Rep., vol. 41, No. 39, Sept. 24, 1926. Reprint No. 1113.

II. The Reporting of Notifiable Diseases in a Typical Small City. Pub. Health Rep., vol. 41, No. 41, Oct. 8, 1926. Reprint No. 1116.

III. The Extent of Medical and Hospital Service in a Typical Small City. Pub. Health Rep., vol. 42, No. 2, Jan. 14, 1927. Reprint No. 1134.

IV. The Age Curve of Illness. Pub. Health Rep., vol. 42, No. 23, June 10, 1927. Reprint No. 1163.

V. A Comparison of the Incidence of Illness and Death. Pub. Health Rep., vol. 42, No. 25, June 24, 1927. Reprint No. 1167.

VI. The Illness Rate Among Males and Females. Pub. Health Rep., vol. 42, No. 30, July 29, 1927. Reprint No. 1172.

VII. The Causes of Illness at Different Ages. Pub. Health Rep., vol. 43, No. 18. Reprint No. 1225.

VIII. The Incidence of Various Diseases According to Age. Pub. Health Rep. vol. 43, No. 19. Reprint No. 1227.

ailments or those conditions which were manifested by subjective symptoms, was obtained for these informants than for other members of the household?

It is at once apparent that this condition could have no appreciable effect upon the illness rate among younger persons (up to 20 years of age); but the possibility of its effect upon comparative rates for certain diseases among adult males and females is undoubtedly great. This applies with especial force, of course, to diseases the occurrence of which is manifested in subjective symptoms only and the diagnosis of which is differentiated thereby. The records of diseases and conditions which manifest themselves in objective ways obviously are not so liable to this error. But undoubtedly the tendency on the part of the informant to report illnesses incident upon herself more completely than illnesses in others must nearly always be regarded as a weakness in the data whenever the method of collecting them does not eliminate it.

This weakness in the present study is difficult to eradicate, and we can only do so partially by two methods. One is to limit comparison of rates for males and females to those diseases which do manifest themselves in objective rather than subjective ways. The other is to select from our population groups of persons of opposite sex whose records were not subject to this incomparability. Both of these methods were followed, with the results that the illness data are reported (1) as recorded for persons of different sex-age groups for infectious diseases, diseases and conditions of the eye, ear, skin and kidneys and annexa, and external causes; (2) as recorded for other diseases and conditions for persons of different sexes and ages *under 20 years of age;* and (3) as recorded in a selected group of adults. The selection of the latter group was made in such a way as to eliminate as far as possible the effect of the condition already referred to, that many women reported their own illnesses and ailments whereas relatively few men did, as follows: We used the records of those families in which more than one adult female and at least one adult male were continuously resident. Since the original record contained a notation as to the identity of the informant on each case of illness, it was possible to compare the incidence of illness among those for whom other informants gave the information. In order to render as comparable as possible the two sets of records, only persons of adult age were included. A comparison of three groups was possible: (1) Women reporting upon themselves; (2) women reported upon by other women in the same households; and (3) men in the same households who were reported upon, usually by their wives.

The size of the experience in each sex and age group, upon which the results presented in this communication are based, was as follows:

Number of white males and females observed for the incidence of disease in Hagerstown, Md., December 1, 1921–March 31, 1924, expressed in terms of "years of life observed" and classified by age

Age, in years	Number of years of life observed	
	Males	Females
All ages [1]	8,001	8,516
0–4	942	835
5–9	1,093	1,012
10–14	846	867
15–19	677	712
20–24	523	613
25–29	545	691
30–34	581	654
35–44	1,038	1,133
45–54	822	854
55–64	428	472
65 and over	346	464

[1] Includes population of unknown age.

The data as recorded for those diseases which we considered fairly suitable for sex comparisons in any age period are given in Table 1. The rates on an annual basis are given in Table 2.

TABLE 1.—*Number of cases of certain diseases and conditions among males and females in a canvassed group of white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

Disease or condition	Sex	Number of cases							
		All ages [1]	0–4	5–9	10–14	15–24	25–44	45–64	65+
Epidemic, endemic and infectious diseases (1–42, except 11 and 31).	Males	740	336	326	87	13	15	8	2
	Females	725	292	292	50	27	38	18	6
Diseases of the eyes and annexa (85)	Males	73	10	20	13	8	12	7	2
	Females	66	5	14	16	3	13	10	4
Diseases of ears and mastoid process (86)	Males	106	41	25	21	11	5	3	------
	Females	142	31	53	24	9	19	3	2
Diseases of skin and cellular tissue (151–154, part of 205). [2]	Males	179	42	53	34	15	22	9	3
	Females	142	29	32	23	12	26	10	9
External causes (165–203)	Males	398	81	64	44	56	100	76	19
	Females	258	20	32	31	26	51	66	19

[1] Including unknown age.
[2] Includes rash, hives, and sores on body.

TABLE 2.—*Incidence of certain diseases and conditions among males and females in a canvassed group of white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

Disease or condition	Sex	Annual rate per 1,000							
		All ages	0–4	5–9	10–14	15–24	25–44	45–64	65+
Epidemic, endemic and infectious diseases (1–42, except 11 and 31).	Males	92.5	356.8	298.3	43.7	10.8	6.9	6.4	5.8
	Females	85.1	340.6	288.6	57.7	20.4	15.3	13.6	12.9
Diseases of the eyes and annexa (85)	Males	9.1	10.6	18.3	15.4	6.7	5.5	5.6	5.8
	Females	7.8	6.0	13.8	18.5	2.3	5.3	7.5	8.6
Diseases of ears and mastoid process (86)	Males	13.3	43.5	22.9	24.8	9.2	2.3	2.4	------
	Females	16.7	37.1	52.4	27.7	6.8	7.7	2.3	4.3
Diseases of skin and cellular tissue (151–154, part of 205). [1]	Males	22.4	44.6	48.5	40.2	12.5	10.2	7.2	8.7
	Females	16.7	34.7	31.6	26.5	9.1	10.5	7.5	19.4
External causes (165–203)	Males	49.7	32.9	58.6	52.0	46.6	46.2	60.9	54.9
	Females	30.3	24.0	31.6	35.8	19.6	20.6	49.8	40.9

[1] Includes rash, hives, and sores on body.

The incidence of infectious diseases was found to be higher among boys than among girls, which is in line with general morbidity and mortality experience. In every age period after 10 years, however, the female rate is higher than the male rate, an indication which is not so generally observed and regarding which not a great deal of data have been published. The number of cases for most of the diseases included under this general title is too small to warrant comparisons according to age.[3] For measles, whooping cough, and chicken pox the number of cases is perhaps sufficiently large to record for different age groups, and is given in Tables 3, 4, and 5, and plotted in Figure 1. The male rate for measles, which disease occurred in epidemic form during the period of study, was under that of females; the reverse was true for chicken pox and whooping cough.

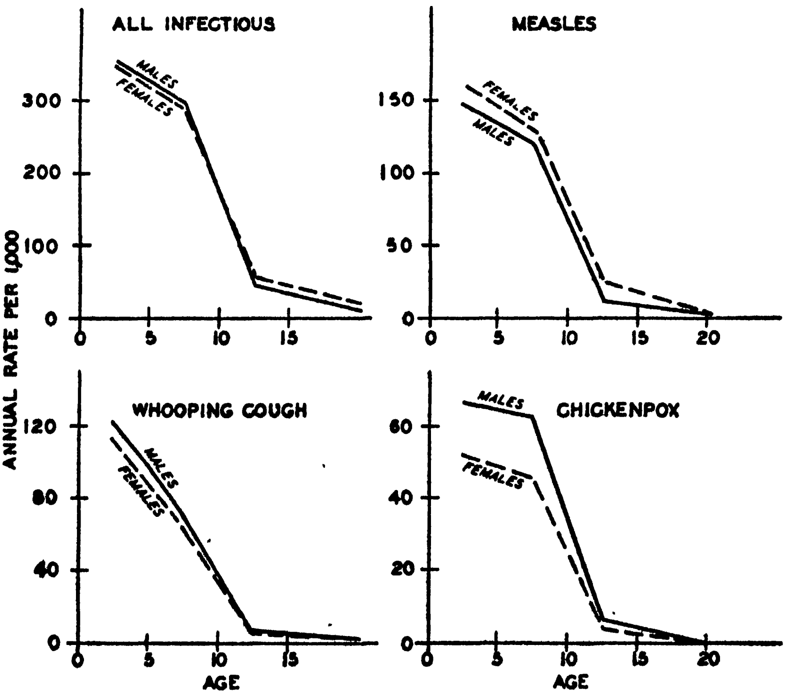


FIG. 1.—Incidence of infectious diseases manifested in illness among boys and girls in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

[3] See Tables 1 and 2 in Hagerstown Morbidity Studies No. I for number of cases and rates by diseases for males and females of all ages.

TABLE 3.—*Incidence of measles among males and females, by age, in a canvassed group of white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

Age	Annual rate per 1,000		Number of cases	
	Males	Females	Males	Females
All ages	34.9	33.9	279	289
0–4	147.6	160.4	139	134
5–9	119.0	129.5	130	131
10–14	9.5	23.1	8	20
15–24	0.8	2.3	1	3
25–44	.5	.4	1	1
45–64				
65+				

TABLE 4.—*Incidence of whooping cough among males and females, by age, in a canvassed group of white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

Age	Annual rate per 1,000		Number of cases	
	Males	Females	Males	Females[1]
All ages	25.5	20.0	204	170
0–4	122.1	112.5	115	94
5–9	71.4	63.3	78	64
10–14	8.3	5.8	7	5
15–24	0.8	1.5	1	2
25–44	.5	1.2	1	3
45–64	1.6	.8	2	1
65+				

[1] Including 1 case in which the age was not known accurately enough for classification.

TABLE 5.—*Incidence of chicken pox among males and females, by age, in a canvassed group of white persons of Hagerstown, Md., December 1, 1921–March 31,*

Age	Annual rate per 1,000		Number of cases	
	Males	Females	Males	Females
All ages	17.4	10.9	139	93
0–4	66.9	51.5	63	43
5–9	63.1	45.5	69	46
10–14	7.1	4.6	6	4
15–24				
25–44	0.5		1	
45–64				
65+				

With reference to eye diseases and conditions, as shown in Figure 2 some differences between the sexes are apparent which may not be really significant on account of the small numbers involved. The excess in the male rate under 10 years of age was confined to a slightly higher incidence of pink eye and conjunctivitis, which possibly reflects the generally higher prevalence of infections among boys than among girls. The excess in the female rate in the older adult ages was due to "other eye trouble," which might have resulted from a failure on the part of informants to report similar conditions for males.

The sex-age curves for ear diseases and conditions are generally similar, as Figure 3 shows. The somewhat higher rate among girls aged 5 to 9 was due to a greater prevalence of otitis media and

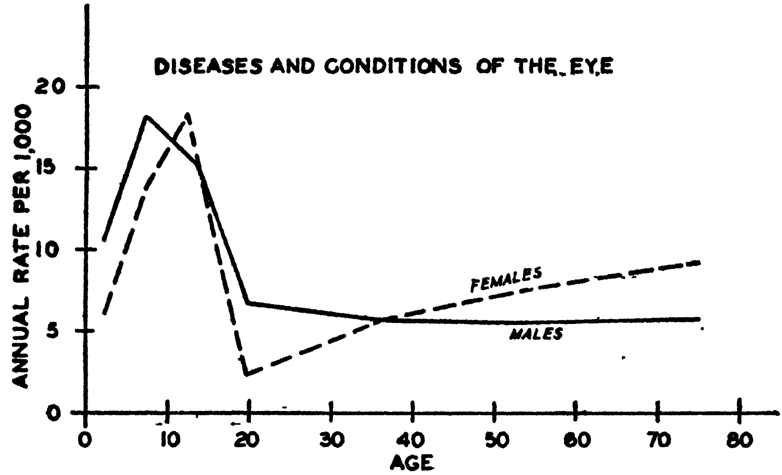


FIG. 2.—Incidence of diseases and conditions of the eye as manifested in illness among males and females of different ages in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

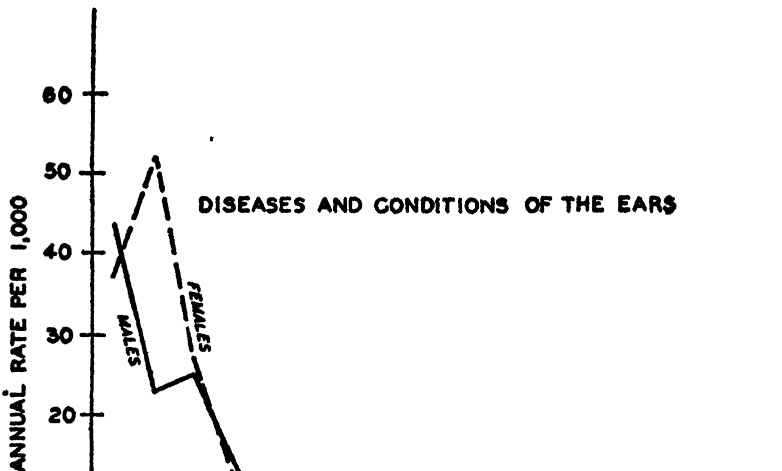


FIG. 3.—Incidence of diseases and conditions of the ear as manifested in illness among males and females of different ages in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

"earache," but the numbers are not large enough to justify any generalization.

The excess in the male rate for skin diseases and conditions under 20 years of age, as shown in Figure 4, occurs in spite of the fact that scabies and pediculosis were somewhat more prevalent among girls than among boys, as shown by Collins' data for the Hagerstown school children (*1*). This indication is again in accordance with the tendency for boys to be affected by infectious conditions to a greater extent than girls. In other age groups the age curves for this group of diseases is generally similar.

Keeping in mind the fact that practically all disabilities resulting from external causes were accidents, the rate for males is higher than that for females in every age period and is relatively highest in the

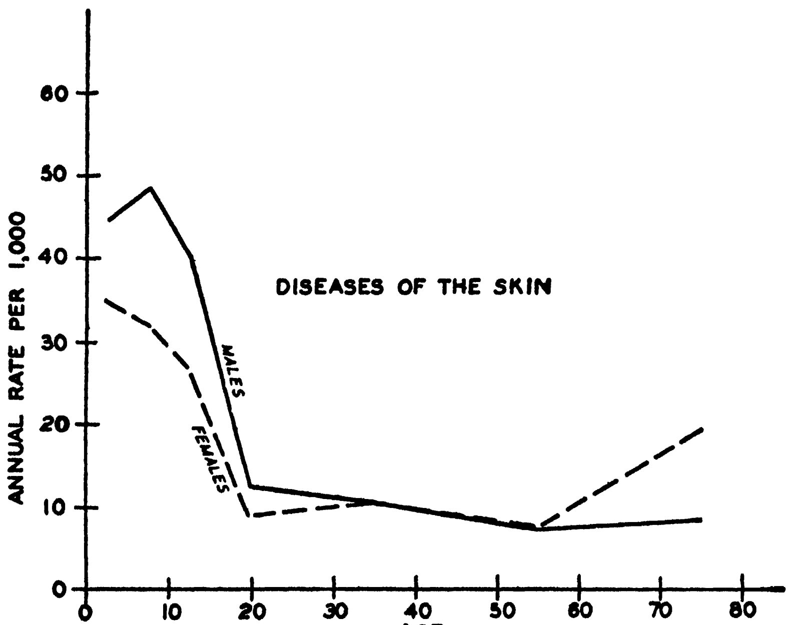


FIG. 4.—Incidence of diseases of the skin as manifested in illness among males and females of different ages in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

young adult (15 to 44 years) ages. (See Table 2 and fig. 5.) The accidents included are both industrial and nonindustrial; and this greater excess in the adult male rate at these ages may be safely ascribed to the greater frequency of accidents occurring directly or indirectly in connection with work. The proverbial greater adventuresomeness of boys is borne out by these accident statistics, and is exhibited in greatest degree in the age period 5 to 9 years. Between the ages of 9 and 15 the sex difference is diminished considerably, the accident rate for boys decreasing and the rate for girls increasing.

The size of the excess in the female rate over the male rate for nonvenereal diseases of the genito-urinary system from the beginning of

adolescence until old age was somewhat surprising and led us to doubt the comparability of the record for the two sexes. In all probability the records are not comparable from the viewpoint of completeness, but that there is a considerable excess in the female rate can not be doubted, for this group of diseases and conditions includes dysmenorrhea and kindred conditions that are peculiar to women. Brundage (*2*) reports for the (Boston) Edison Co. an annual rate of only 9 disabilities of one day or longer per 1,000 males for nonvenereal genito-urinary diseases as against 314 per 1,000 females of which 306 were due to dysmenorrhea and kindred conditions. These are ex-

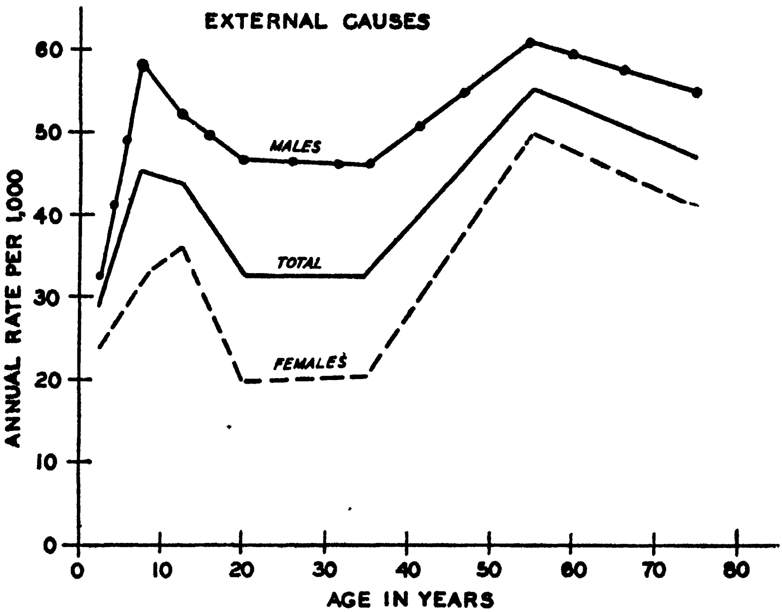


FIG. 5.—Incidence of disabilities from external causes among males and females of different ages in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

clusive of puerperal diseases and conditions which are shown separately in Figure 6. (For data and rates see Hagerstown Morbidity Studies, No. VIII.)

Sex differences in the incidence of respiratory, nervous, digestive, and circulatory diseases probably are accurately indicated by our records for persons under 20 years of age for the reason that those individuals were reported upon by some other person, usually the mother. (See Tables 7, 10, 11, and 13.) Therefore we have plotted the age specific rates for the four disease groups in Figure 7. The indications are not without interest. In general, young boys were affected to a greater extent than young girls by all of these diseases, but in adolescence precisely the opposite is true. Respiratory diseases and conditions were more frequent among boys in the age

periods 0 to 4 and 5 to 9, and among girls in the ages 10 to 24. Although both sexes under 5 years of age were affected about equally by nervous diseases and disorders, in the succeeding quinquennial period the male rate was higher, followed by a definite excess in the female rate in the age period 10 to 24. The excess in the male rates for digestive diseases and disorders, and circulatory conditions and diseases was confined to the age period 0 to 4 years; in the age period 5 to 9 years and in adolescence the female rates for both disease groups were definitely in excess of the male rates, especially for circulatory diseases and conditions. The number of cases is hardly large enough

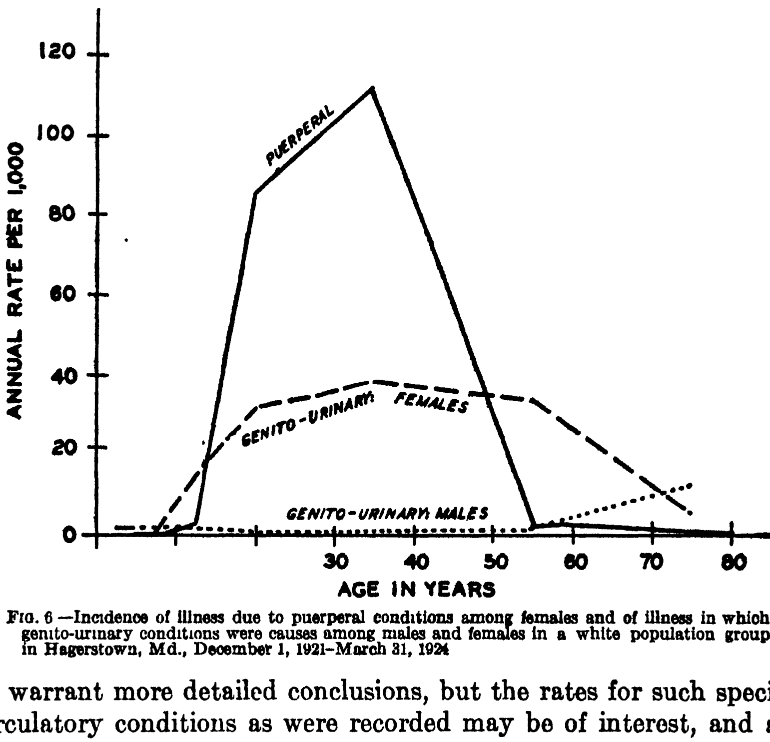


FIG. 6.—Incidence of illness due to puerperal conditions among females and of illness in which genito-urinary conditions were causes among males and females in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

to warrant more detailed conclusions, but the rates for such specific circulatory conditions as were recorded may be of interest, and are presented in Table 6.

TABLE 6.—*Incidence of specific circulatory diseases and disorders among males and females under 25 years of age in a white population group of Hagerstown, Md., December 1, 1921–March 31, 1924*

Condition	Sex	Annual rate per 1,000 for age periods			
		0-4	5-9	10-14	15-24
Heart disease	Males		0.92	4.73	5.00
	Females		3.95	15.00	9.06
Adenitis	Males	15.93	3.66	4.73	2.50
	Females	7.18	8.90	8.07	2.26
Hemorrhage [1]	Males	1.06	3.66		
	Females			1.15	.75

[1] Including "nose bleeding."

TABLE 7.—*Incidence of respiratory attacks among males and females, by age, in a canvassed group of white persons of Hagerstown, Md., December 1, 1921,–March 31, 1924*

Age	Annual rate per 1,000		Number of cases [1]		Age	Annual rate per 1,000		Number of cases [1]	
	Males	Females	Males	Females		Males	Females	Males	Females
All ages	602	723	4,815	6,157	25-29	407	586	222	405
0-4	974	861	917	719	30-34	437	724	254	474
5-9	949	919	1,037	930	35-44	427	734	443	832
10-14	733	838	620	726	45-54	470	701	386	599
15-19	469	579	318	412	55-64	452	688	193	325
20-24	384	539	201	330	65+	477	666	165	309

[1] Including cases among 59 males and 96 females whose ages were not known accurately enough for classification.

Adenitis thus accounted for the excess in the male rate under 5 years of age, whereas the female rate for every condition save one was higher in the later ages.

We may now turn to some comparisons of disease incidence in adult males and females that are more difficult, because of the possibility that the records are more complete for females than for males.

The respiratory illness rate as recorded by us was higher among females in every age period except under 10 years. As already noted, the excess of the male rate in children was greatest under 5 years, diminished in the second quinquennial period, and in the third the reverse appeared. The excess of the female rate then continues throughout the remainder of the life span. These results are in conformity with those found by Surgeon J. G. Townsend and the writer (*3*) in the experience of families of medical officers of the Army, Navy, and Public Health Service, for persons up to 25 years of age, but are in contradiction to those found for persons 25 years of age and over. The ratios of the female respiratory rates to the male rates at different ages in the medical officers' families were as follows:

Ratio of respiratory attack rate among females to that among males in families of medical officers of Army, Navy, and Public Health Service, 1924

Age	Ratio $\frac{\text{female}}{\text{male}}$	Age	Ratio $\frac{\text{female}}{\text{male}}$
0-4	0.94	25-34	0.80
5-9	.92	35-44	.92
10-14	1.09	45-54	.83
15-24	1.23	55+	.96

Now, the attacks in the medical officers' families were reported by the medical officers themselves, and the medical officers constituted practically all of the male population 35 years of age and over; in the middle and later adult ages, therefore, the males reported upon

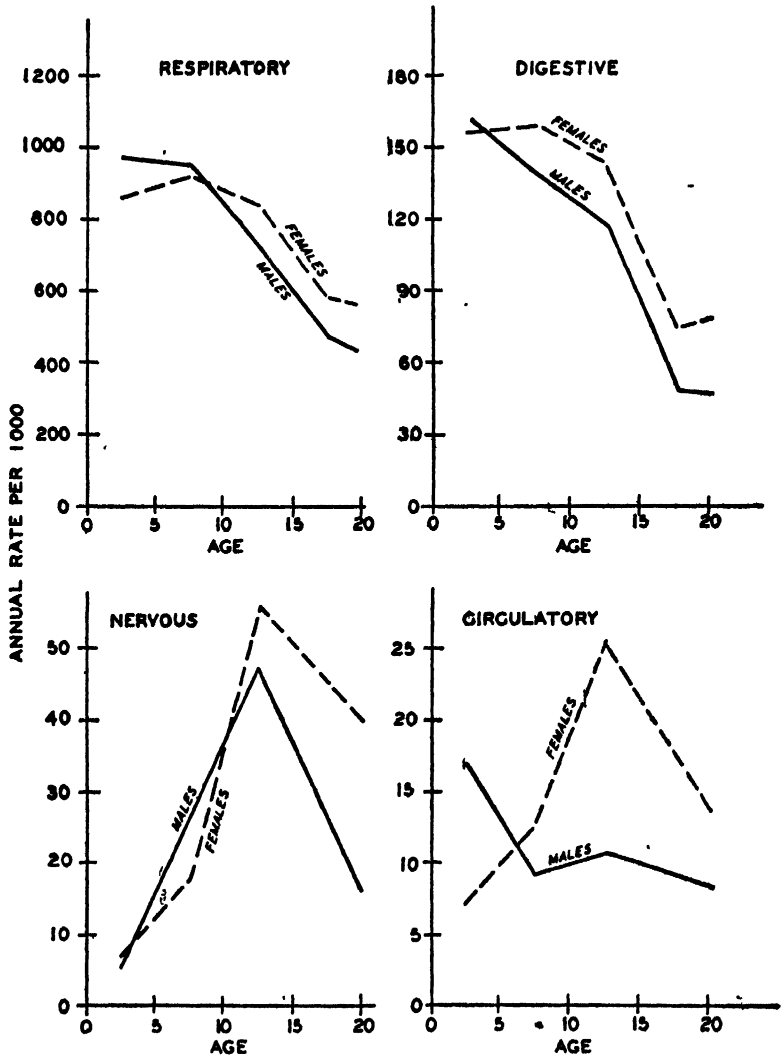


FIG. 7.—Incidence of respiratory, digestive, nervous, and circulatory diseases and conditions as manifested in illness among boys and girls in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

themselves, which is in contrast to the situation in Hagerstown, where, in the middle and later adult ages, the females reported upon themselves. The difference in the results of these two studies would seem to be due, therefore, chiefly to differences in the source of

information.[4] The possibility that one result may be nearer the truth than the other, however, ought to be considered, and the matter need not rest here; for, using the records for Hagerstown households where both adult males and adult females were *reported upon*, we find that the ratio of the adult female respiratory rate to the adult male was 1.2 to 1. For the entire adult population observed, this ratio was 1.5 to 1. So that for the kind of respiratory attacks that were recorded in the Hagerstown study the influence of the source of information upon its accuracy in this particular respect does not seem to account for all of the higher rate for females. Furthermore, this Hagerstown result is corroborated by all the indus-

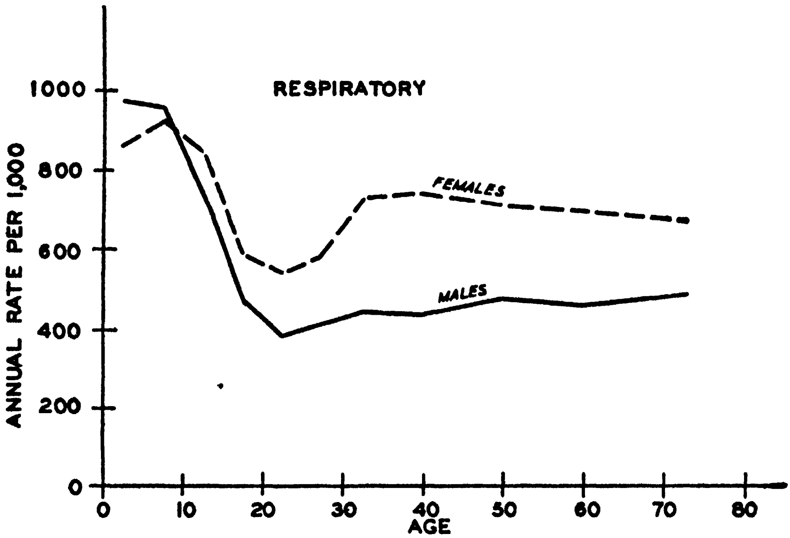


FIG 8—Incidence of respiratory diseases as manifested in illness among males and females in a white population group in Hagerstown, Md, December 1, 1921–March 31, 1924

trial morbidity experience bearing upon this point that we have collected For example, Brundage (*2*) has reported the (Boston) Edison Co.'s 10 years' experience of illness resulting in at least one day of disability, which gives a ratio of the adult female respiratory rate to the adult male rate of 1.70 to 1. Similarly, four years' records (*4*) of more serious illnesses (eight days or more of disability) among a large group of industrial employees has shown a sex ratio of 1.47 (females) to 1 (males) for respiratory diseases, exclusive of influenza, for which the ratio is 1.10 to 1.

[4] The data of the two studies are not comparable in some other respects Thus the annual respiratory attack rate in the medical officers' families was 2,009 per 1,000, as contrasted with only 657 in the Hagerstown group In the latter, only those attacks which manifested themselves in some degree of illness, as the word is ordinarily understood, were recorded, whereas in the former group it was the intention to secure records of all definite respiratory attacks regardless of the degree of sickness involved. Again, in the medical officers' families practically every attack was reported by a physician, whereas in the Hagerstown group only a small proportion of respiratory attacks of a minor nature were attended by physicians.

TABLE 8.—*Number of cases of diseases of the kidneys and annexa among males and females in a canvassed group of white persons of Hagerstown, Md., December 1, 1921—March 31, 1924*

Disease or condition	Sex	Number of cases							
		All ages [1]	0-4	5-9	10-14	15-24	25-44	45-64	65+
Diseases of kidney and annexa (128-134)	Males	77	3	7	4	3	14	22	23
	Females	160	13	5	7	8	36	56	31
Nephritis, acute and chronic (128, 129)	Males	31	1	1	1	1	6	9	12
	Females	52			2	5	2	23	19
Kidney trouble (unqualified) (131)	Males	24	1	3	3	2	5	5	5
	Females	67	13	4	5	3	22	14	5
Calculi of the urinary passages (132)	Males	7					2	4	1
	Females	7					1	4	2
Cystitis (133)	Males	5					1	1	3
	Females	18					8	9	4
Bladder trouble (133)	Males	10	1	3				3	2
	Females	14		1			6	6	1

[1] Includes cases among 1 male and 4 females whose ages were not known accurately enough for classification.

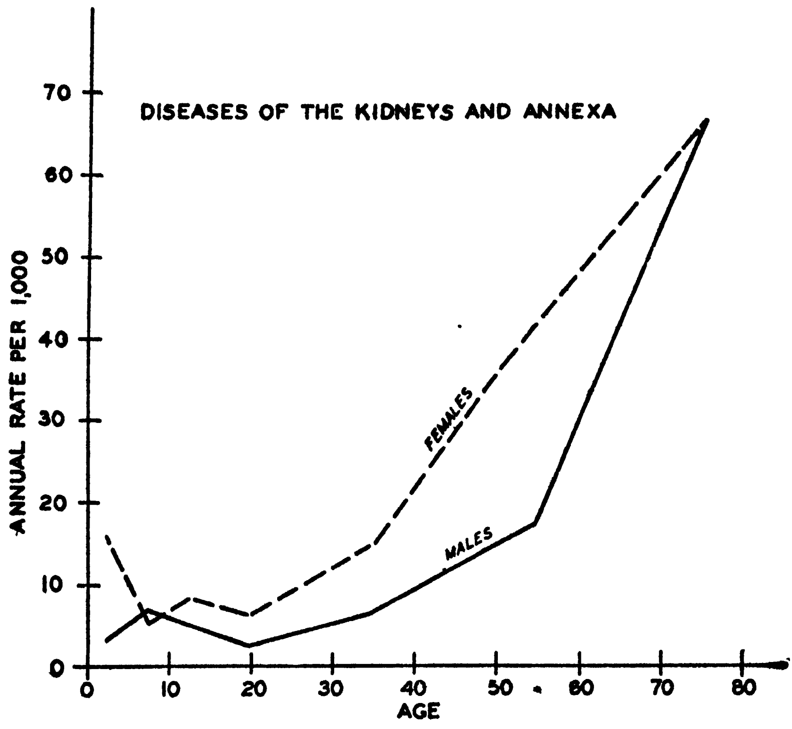


FIG. 9.—Incidence of diseases of the kidneys and annexa as manifested in illness among males and females in a white population group in Hagerstown, Md., December 1, 1921-March 31, 1924

The rates as given in Table 7 and as plotted in Figure 8 do, we believe, represent a real sex difference in the incidence of respiratory diseases according to age in a general population group.

The excess of the female rate for kidney diseases at almost every age, as shown in Tables 8 and 9 and Figure 9, is contrary to mor-

tality experience. Whether or not the illnesses from these causes were more completely reported for females than for males, it is difficult to say; the number of cases was too small, in the selected group already referred to, to yield any indication on this point. Keeping in mind that the experience for the entire population is not large, the consistency of the excess in the female rate is not without possible significance. The detailed rates of diseases in this group are given as a matter of record, but we are not in a position to comment upon the apparent sex differences at the present time.

TABLE 9.—*Incidence of diseases of the kidneys and annexa among males and females in a canvassed group of white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

Disease or condition	Sex	Annual rate per 1,000							
		All ages	0–4	5–9	10–14	15–24	25–44	45–64	65+
Diseases of kidney and annexa (128–134)	Males	9.6	3.2	6.4	4.7	2.5	6.5	17.6	66.5
	Females	18.8	15.6	4.9	8.1	6.0	14.5	42.2	66.8
Nephritis, acute and chronic (128, 129)	Males	3.9	1.1	.9	1.2	.8	2.8	7.2	34.7
	Females	6.1			2.3	3.8	.8	17.3	40.9
Kidney trouble (unqualified) (131)	Males	3.0	1.1	2.8	3.6	1.7	2.3	4.0	14.5
	Females	7.9	15.6	4.0	5.8	2.3	8.9	10.6	10.8
Calculi of the urinary passages (132)	Males	.9					.9	3.2	2.9
	Females	.8					.4	3.0	4.3
Cystitis (133)	Males	.6					.5	.8	8.7
	Females	2.1					1.2	6.8	8.6
Bladder trouble (133)	Males	1.3	1.1	2.8				2.4	5.8
	Females	1.6		1.0			2.4	4.5	2.2

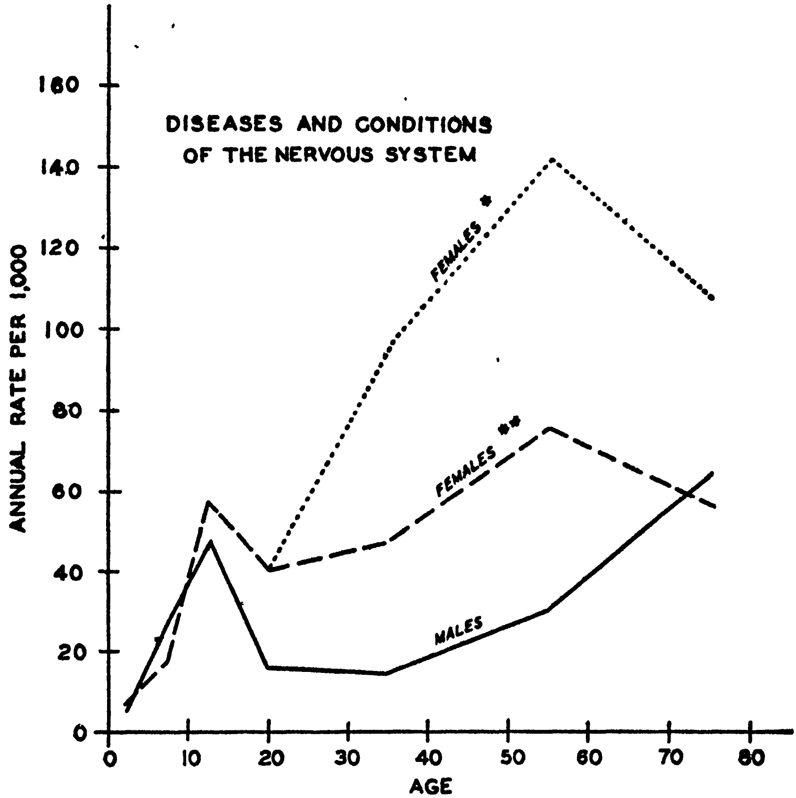
The female rate for diseases and conditions of the nervous system, as it was recorded (Table 10), is higher than the male rate in every age group after 10 years. Since we have included under this heading all headaches that presumably were not symptoms of some other condition noted, and since most of the manifestations of these diseases and conditions are subjective in character, some of the excess of the female rate in adult ages might easily have been due to the tendency for women informants to have reported more completely their own ailments than those of their husbands.

TABLE 10.—*Incidence of diseases of the nervous system, by age, among males and females in a canvassed group of white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

Age	Annual rate per 1,000		Number of cases [1]		Age	Annual rate per 1,000		Number of cases [1]	
	Males	Females	Males	Females		Males	Females	Males	Females
All ages	23.3	72.3	186	616	15–24	15.8	40.0	19	53
0–4	5.3	7.2	5	6	25–44	14.3	96.1	31	238
5–9	26.5	17.8	29	18	45–64	29.6	141.7	37	188
10–14	47.3	56.5	40	49	65+	63.6	107.7	22	50

[1] Including cases among 3 males and 14 females whose ages were not known accurately enough for classification.

As a matter of fact, in those households where a comparison could be made of the rates for the two sexes when both were reported upon by others, the ratio of the adult female to the adult male rate for nervous diseases was only 2.58 to 1, as contrasted with 4.94 to 1 for the entire adult population studied. In plotting the sex-age curves in Figure 10 for illnesses in which nervous diseases or conditions were involved, a rough correction has been attempted for this factor by reducing the recorded rate by 48 per cent. The female rate is still



* Rate as recorded.
** Rate as estimated from the incidence among families reported upon by informants other than themselves.

FIG. 10.—Incidence of diseases and conditions of the nervous system as manifested in illness among males and females in a white population group in Hagerstown, Md., December 1, 1921–March 31, 1924

in excess of the male rate from the ages 10 to 65, and this indication is corroborated by our industrial morbidity experience. For example, the (Boston) Edison Co.'s (*2*) 10 years' record shows a ratio of female rate to male rate of 4.1 to 1 for nervous disabilities of one day or longer. The four years' record of illness causing disability of eight days or longer in a large group of industrial workers showed a ratio of 2.4 to 1 (*4*).

Similarly, our record of digestive diseases (Table 11) shows a considerable excess in the adult female rate over the adult male rate in all age periods, but in the group of males and females reported upon by others in the same household this excess persists to the extent of a ratio of 1.8 to 1, which is not so greatly below that for the entire adult population, which was 2.1 to 1. Brundage (*2*) data for the (Boston) Edison Co. give a ratio of 2 to 1, while the records of more serious digestive illnesses (*4*) give a ratio of 1.8 to 1. The excess of the adult female illness rate from digestive causes seems, therefore, to be about 80 to 100 per cent above the male rate. For some of the specific diseases and conditions the rates (all ages) are shown in Table 12.

TABLE 11.—*Incidence of diseases of the digestive system among males and females, by age, in a canvassed group of white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

Age	Annual rate per 1,000		Number of cases [1]		Age	Annual rate per 1,000		Number of cases [1]	
	Males	Females	Males	Females		Males	Females	Males	Females
All ages	83.6	119.3	669	1,016	15–24	48.3	74.0	58	98
					25–44	42.0	96.9	91	240
0–4	161.4	155.7	152	130	45–64	68.1	147.8	85	196
5–9	139.1	158.2	152	160	65+	83.8	114.2	29	53
10–14	117.0	143.0	99	124					

[1] Includes cases among 3 males and 15 females whose ages were not known accurately enough for classification.

TABLE 12.—*Incidence of certain digestive diseases and conditions among males and females as recorded in a white population group of Hagerstown, Md., December 1, 1921–March 31, 1924*

Disease or condition	Annual rate per 1,000		Disease or condition	Annual rate per 1,000	
	Males	Females		Males	Females
"Indigestion" and "upset stomach"	40.1	49.1	Hernia	2.3	1.1
"Stomach trouble" and nausea	7.4	9.2	Biliary calculi	1.4	7.2
Diarrhea	12.0	14.4	Cholecystitis	.4	3.4
Appendicitis	3.3	8.6	Jaundice	2.3	3.2
			"Biliousness"	7.3	13.4

The Hagerstown record of the illness rate from diseases and conditions of the circulatory system among adults is at variance with industrial experience. As indicated in Table 13, the adult female rate is higher than the male rate in all age periods except "65 years and over," whereas the Edison Co.'s (*2*) experience of disabilities of one day or longer due to these causes shows that the female rate was only 82 per cent of the male rate and the industrial employees' record of disabilities lasting eight days or longer shows that the female rate was 92 per cent of the male, all of these wage earners being under 65 years of age. The wage earners were all

actively employed, however, and it is possible that a higher prevalence of circulatory diseases may characterize the nonwage-earning women than men. Upon this point we have no adequate data as yet.

TABLE 13.—*Incidence of diseases of the circulatory system among males and females, by age, in a canvassed group of white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

Age	Annual rate per 1,000		Number of cases [1]		Age	Annual rate per 1,000		Number of cases [1]	
	Males	Females	Males	Females		Males	Females	Males	Females
All ages	18 4	29 4	147	250	15–24	8 3	13 6	10	18
					25–44	11.6	19.4	25	48
0–4	17.0	7.2	16	6	45–64	26.4	60.3	33	80
5–9	9 2	12 9	10	13	65+	124 2	112.0	43	52
10–14	10 6	25.4	9	22					

[1] Includes cases among 1 male and 11 females whose ages were not known accurately enough for classification.

SUMMARY

To summarize our findings on differences in the incidence of various diseases as manifested in illness between males and females:

In general, the incidence of most diseases is higher among boys than among girls under the age of 5, and for some diseases the excess of the male rate persists in the age group 5 to 9 years. In the adolescent ages, however, the opposite is true, the principal exceptions being diseases of the ears and eyes. In the adult ages, the Hagerstown records show a higher female rate for all diseases for which comparisons are warranted. The only definite exception to the excess in the female rate in ages 10 years and over is the incidence of disabilities from external causes, nearly all of which were accidents.

ACKNOWLEDGMENTS

The continuous field observations upon which the foregoing report is based were made by the following assistants: F. Ruth Phillips, Mrs. Mary King Phillips, Louise Simmons, Mrs. Clara Bell Ledford, Clarice Buhrman, and Mrs. Alcesta Owen, under the immediate supervision of Passed Asst. Surg. R. B. Norment, jr., Acting Asst. Surg. A. S. Gray, and, later, Surg. C. V. Akin.

In the analysis of the data I am especially indebted to Miss Phillips and to Associate Statistician S. D. Collins and Assistant Statistician Dorothy G. Wiehl, and other members of the statistical staff, as well as to several officers of the Public Health Service for constant advice on medical points.

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STATISTICS OF ADMISSIONS TO HOSPITALS FOR THE INSANE

The United States Public Health Service is making an attempt to secure and publish regularly current monthly data relative to admissions to hospitals for the care and treatment of insane persons in the United States. For this purpose monthly reports are being sought from institutions in each State which care for this class of patients, and it is believed that, with the cooperation of these hospitals, the information published will be of considerable value not only to all persons interested in mental hygiene, but to health authorities generally. For the present time it will be possible to secure and classify the data by sex and psychoses only. It is desired, of course, to make these statistics as complete as possible, and therefore the cooperation of all institutions for insane patients is most earnestly desired.

On page 1288 of this issue of Public Health Reports there are published the reports that have been received of first admissions to hospitals for the insane for the month of January, 1928. The tabulation includes 2,103 first admissions classified by psychoses and by sex of patient. These reports were received from 83 institutions, located in 30 States, the District of Columbia, and the Territory of Hawaii. Reports from other institutions are expected, and data for later months will be published as soon as compiled.

COURT DECISION RELATING TO PUBLIC HEALTH

Lighting and ventilation provision in city housing code upheld.—(Oregon Supreme Court; Daniels *v.* City of Portland et al., 265 P. 790; decided March 27, 1928.) The housing code of the city of Portland, which code came into existence in 1919, contained a provision reading as follows:

SEC. 123. No room in a dwelling erected prior to the passage of this code shall hereafter be occupied for living purposes unless it shall have a window of an area of not less than 8 square feet opening directly upon the street, or upon a rear yard not less than 10 feet deep, or above the roof of an adjoining building, or upon a court or side-yard not less than 25 feet square in area, open to the sky without roof or skylight, unless such room is located on the top floor and is adequately lighted and ventilated by a skylight opening directly to the outer air.

A hotel building, constructed in 1907 under a permit granted by the city pursuant to the building code provisions then in force, had certain rooms, designed as sleeping and housekeeping rooms, with windows opening only upon a light well or court. The said light well or court was covered at the top with a sloping canopy, constructed partly of translucent glass and partly of wood or other supporting material, and the only opening in the canopy was a small ventilator. The plaintiff, the owner of the hotel, alleged that the chief health inspector of the city, under threat of immediate arrest, illegally ordered and directed him to remove the skylight over the court, or immediately to cease using or renting for sleeping purposes rooms having windows opening on the court. In a suit to enjoin the city from enforcing the above-quoted provision of the housing code the plaintiff contended that the said provision was unconstitutional, and that the ordinance was arbitrary and not a proper exercise of the police power vested in the city. The supreme court stated that the right of regulation, under the police power, was not limited by the fact that the value of an investment would be lessened, and that, as the record tended to show an unhealthful condition in the matter of ventilation, it became the plaintiff's duty, upon complaint to the proper authorities, to abate the condition in some feasible and efficient manner. Regarding the plaintiff's assertion that the ordinance was retrospective, the court said that the building permit granted by the city for the construction of the hotel did not "affect the right of the police power of the city of Portland to adopt and apply to it regulative measures looking to the public health." The trial court's decree, dismissing the complaint, was affirmed.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Preliminary Report of the Investigation of the Pollution of the Mississippi River in the Vicinity of Minneapolis and St. Paul. H. R. Crohurst. Unpublished report made under supervision of U. S. Public Health Service in cooperation with the States of Minnesota and Wisconsin and the cities of Minneapolis and St. Paul. 86 pages. (Abstract by H. R. Crohurst.)

The basic data collected during a study of the pollution of the upper Mississippi River, between Minneapolis and Winona, Minn., in connection with a joint investigation by the Public Health Service, the States of Minnesota and Wisconsin and the cities of Minneapolis and St. Paul, during the period June, 1926–August, 1927, has been made available, in mimeograph form, for the use of the cooperating agencies, to assist in the solution of the sewage-disposal problem existing in that portion of the Mississippi River.

The report contains summarized results, as monthly averages of the chemical and bacteriological examinations and the hydrometric data. Population estimates, estimates of sewered population, population equivalent to industrial wastes, and other pertinent data are presented.

The disposal of the sewage of the Twin Cities, by dilution, is complicated by a dam located below Minneapolis, behind which there is a considerable deposition of sewage solids from the city sewage as a result of decreased velocity in the river. The problem of the disposal of the sewage from the remainder of the metropolitan area will be still further complicated by the construction of a second dam, in the near future, which will form a second pool immediately below the present one and will decrease the velocity in the river through St. Paul and South St. Paul.

Indications are that the sewage load in the river will increase so that objectionable conditions through the Twin Cities and as far down stream as Hastings will be of frequent occurrence in the future. The formation of the second pool will intensify the present objectionable conditions.

Studies of methods of sewage disposal are being conducted by the Metropolitan Drainage Commission, created by the last legislature and by the Minnesota State Department of Health. It was primarily to make available the basic data relative to conditions existing in the river, for the use of these State organizations, that the preliminary report was prepared.

Milwaukee Metropolitan Sewerage District Problem. T. Chalkley Hatton. Proceedings of Ninth Texas Water Works Short School, January 24–29, 1927. pp. 297–300. (Abstract by H. E. Hargis.)

The city of Milwaukee has a population of approximately 560,000 and an area of 34 square miles, and surrounding it are 13 separate municipalities of a combined population of 80,000. The city of Milwaukee obtains its water from an intake 70 feet below the lake surface and 6,500 feet from shore. The average daily flow of sewage is about 65,000,000 gallons, and all the water that was used for drinking purposes had *B. coli* present, necessitating chlorination.

In 1913 a statute was passed creating a sewage commission for the city of Milwaukee, but this commission had no power outside the city limits. In 1921, however, a statute was passed creating a metropolitan sewerage commission, and giving it authority to build a sewage-treatment plant outside the city of Milwaukee, and to collect all the sewage from the outlying towns and dispose of it here. The cost of operation was to be assessed against the municipalities in proportion to the amount of sewage each contributed.

An activated sludge plant was installed with a maximum capacity of 128,000,000 gallons. By November 1, 1925, the plant was in operation and satisfactorily treating about 70,000,000 gallons a day. At present it is costing about $11 per

million gallons to treat the sewage, not including interest, sinking fund, or depreciation.

The Public Works of the Ruhr Sanitary District. Karl Imhoff. Pamphlet in German, June, 1927. 8 pages. (Abstract by A. L. Dopmeyer.)

The Ruhr River Sanitary District was established by a Prussian law on June 5, 1913. Its sole purpose is to prevent pollution of the Ruhr River and its tributaries. The total contributing population is about 1,300,000. Industrial wastes are contributed by coal mines, iron and steel works, tanneries, textile works, and cellulose and paper works. According to the law one-third of the cost of carrying on the work of the district is paid by the water works, since they are considered as receiving the greatest benefit.

Most of the construction work has been carried on in the last four years, during which time total expenditures for the years were as follows: 1923, $472,000; 1924, $710,000; 1925, $1,150,000; 1926, $1,970,000; 1927, estimated, $2,140,000.

The works consist of sewage-disposal units, sewerage systems, and pumping plants. To date 36 disposed units, 56.5 miles of collecting sewer, and five pumping plants have been built.

For three towns located near the mouth of the Ruhr, a collecting sewer 6.8 miles long was constructed, which carries this sewage to the main stream—the River Rhine.

In other sections where it was impossible to divert sewage directly to the Rhine, various types of disposal plants have been installed. The methods of treatment used at various places are listed in this article and there are a number of photographic views.

Separate sludge digestion is used in one town of 16,000 and in another of 12,500. A sludge digestion tank, in which the sludge is heated, is used at one place. The sludge digestion tank was installed as an addition to the original Emscher tank. Heat is obtained by burning the gas from the treatment plant. Chlorination of sewage is used only to a limited extent. An activated sludge plant is used at Essen-Rellinghausen, population 45,000. There are very few treatment plants for handling industrial wastes alone, and it has been the general rule to mix the wastes with domestic sewage and treat the mixture.

Stream Pollution in Wisconsin. Wis. State Bd. Health, 1927. pp. XVIII+328. Experiment Station Record, U. S. Dept. of Agriculture, vol. 58, No. 6. April, 1928, p. 585.

"This is a joint report of the Conservation Commission and the State Board of Health of Wisconsin concerning their activities in the control of stream pollution from July 1, 1925, to December 31, 1926.

"The data reported indicate that the discharge of industrial waste into certain streams is the only practical method of ultimate disposal in many cases and constitutes a necessary and proper use of the stream, provided the dilution is so great that there is no menace to public health nor material interference with the natural aquatic life of the stream.

"Nearly all wastes cause reduction of the dissolved oxygen of the stream, and industrial wastes generally have a greater oxygen demand than domestic sewage. Biological oxidation is more rapid during warm weather than during cold weather, so that the oxygen demand of the waste is greater, although the actual amount of oxygen available is less, since warm water retains less oxygen in solution. When the dissolved oxygen of a stream is depleted, green plants and other grasses of aerobic life die and anaerobic organisms such as worms and lower animal life prevail. A stream tends to purify itself by natural processes and will ultimately return practically to normal if the concentration of the wastes is not too great.

"The results of an experimental investigation concerning the efficiency and practicability of chemical treatment in removing substances from pea-cannery wastes that cause local nuisances and objectionable stream pollution showed that by careful operation and the application of about 3.25 pounds of ferrous sulphate and 7.25 pounds of lime per 1,000 gallons of waste, the oxygen demand can be reduced approximately 75 per cent. If the sludge is allowed to accumulate in the tank, the oxygen demand reduction averages only 34 per cent, because the precipitated organic matter goes partially into solution and is carried through the tank. Aeration of the tank effluent will effect a further reduction in the oxygen demand, approximately 50 per cent being indicated by laboratory tests. The chemical treatment will materially reduce stream pollution and prevent local nuisances created by pea-cannery wastes.

"Studies in the treatment of sulphite waste liquor from pulp and paper mills to reduce its oxygen demand in the control of stream pollution showed that ponding and aeration of the waste will effect a very material reduction in its oxygen demand. Mechanical aeration will also reduce the oxygen demand.

"Data from stream pollution surveys are also included."

The Effect of the Activation of Sewage Sludge on Pathogenic Organisms. H. Bruns and F. Sierp. Abstract by M. E. Delafield in *Bulletin of Hygiene*, vol. 2, No. 2, November, 1927, pp. 904–905. (Abstract by R. E. Tarbett.)

Experiments with activated sludge method of sewage treatment were carried on to determine the reduction in pathogenic organisms where definite numbers of such organisms were added to the raw sewage. Sewage containing 450,000 typhoid organisms per cubic centimeter was found to undergo a reduction of 96 per cent after 12 hours' treatment, the greatest effect being secured in the first 6 hours. The clear effluent was practically free from the organisms, such as remained being in the sludge.

Similar reductions were obtained in the case of paratyphoid, bacillary dysentery, and cholera. Anthrax spores were found to have a much greater resistance.

It is suggested that the bacterial destruction is due to the bacteriophagic power of the sewage plankton.

Sanitary Supervision of Tourist Camps and Recreation Places. Lewis S. Finch. *The American City*, vol. 36, No. 5, May, 1926, pp. 661–664. (Abstract by D. W. Evans.)

For the last four years an inspection of all tourist camps has been made by the water and sewage department of the State board of health of Indiana. Water supplies are sampled, methods of disposal of garbage and sewage are investigated, and unsatisfactory conditions noted. The final report of the survey, with recommendations, is sent to the owner and to the local health officer. It is the duty of the latter to require that all recommendations be carried out, otherwise the camp is declared a health nuisance and may be ordered closed. During 1926, of the 233 camps operating, 104 were approved. The regulations dealing with these subjects are noted in the article and include headings on supervision, drainage, water supply, sewage, garbage or waste disposal, and enforcement of the rules.

The second topic gives a general statement with regard to sanitation of resorts, and it is brought out that the "Lake Order" of 1926 will indirectly improve conditions at the resorts by requiring treatment of sewage before discharge into a lake. The third topic briefly states the regulations dealing with swimming pools as tentatively adopted by the conference of State sanitary engineers.

The efficient operation of any of these recreational features depends mainly upon close supervision by an experienced operator, while the responsibility of seeing that sanitary conditions are maintained rests entirely with the local health officer.

Zeolitic Water Softening. Ray Riley. Proceedings of Ninth Texas Water Works Short School, January, 1927, pp. 139–143. (Abstract by H. D. Cashmore.)

A semitechnical discussion of the zeolitic method of softening water and its applications.

The terms "hard" and "soft" are only relative terms and are dependent on the individual using them and the section of the country from which he comes. Hard water is not only an annoyance but an expense. Precipitation of the hardening constituents costs more in soap than the amount of soap required for cleaning purposes; and when this item is eliminated, the saving will in many cases pay for the cost of softening.

The two methods of water softening, namely, the lime-soda process and the zeolite process, are compared as to use, cost and results obtained. The lime-soda method is more suitable where large amounts of water are used; but when small supplies are to be treated, the zeolite method is less expensive. This method has found application to textile industries, power plants, laundries, hotels, and houses. Following are some of the advantages: (1) Complete removal of hardness with no "after reactions"; (2) unaffected by fluctuations in hardness; (3) occupies a small space and simple in operation.

A great deal of variation exists in the zeolites upon the market to-day in reference to operation. There are two general classes of zeolites: (1) Those of natural origin—from clay, from glauconite or greensand; and (2) synthetic—precipitated, gel type. A detailed discussion is given regarding the production and use of these two groups.

The real operation or procedure of softening water by this method is a chemical engineering problem. There are many details which must be worked out and are included in this discussion.

Nitrites Formed in Water by Chlorination. C. E. Morgan. *Water Works*, vol. 67, No. 3, March, 1928, pp. 125–126. (Abstract by C. R. Cox.)

The water supply of Miami, Fla., is derived from wells drilled in limestone. The well water is colored and has a large organic content, especially albuminoid ammonia, but there are no nitrites present in the raw water. The water is coagulated and softened and filtered, but not chlorinated at all times. Following the hurricane, the filtered water was chlorinated. It was ascertained that apparently a large residual chlorine content existed at distant points in the distribution system. Investigation indicated that this was due to the reaction of nitrites with orthotolidine, the nitrites being formed by the oxidation of the albuminoid ammonia by the chlorine. The orthotolidine test is still available for determining chlorine, provided the test is made within 30 minutes after the chlorine is applied. The reaction of nitrites and orthotolidine is slow, requiring 20 minutes for maximum color to appear. False results were also secured when nitrites reacted with starch-iodide reagent.

The Value of Laboratory Tests in Water-Works Operation. A. E. Berry. *Contract Record and Engineering Review*, vol. 42, No. 11, March 14, 1928, pp. 291–294. (Abstract by R. E. Thompson.)

A general discussion, with particular reference to conditions in Ontario. Fifty of the 240 waterworks systems in operation in Ontario include filtration plants, and over 110 employ chlorination. Considerably over 75 per cent of all water used for domestic purposes is purified. The Department of Health maintains 8 laboratories, in addition to an experimental station, located at convenient points to serve the whole Province. Last year over 20,000 samples were analyzed, but, unfortunately, most of these were from a limited number of supplies. Fifty per cent of the supplies had less than 50 analyses made, and 40 per cent had none whatever. The expenditure for a plant laboratory may frequently be offset by the savings in cost of treatment accomplished thereby. Reports are not uncommon in which are recorded reductions in chemicals to the extent of 50 per cent and

amounting to several thousand dollars per year as a result of laboratory control. The importance of adequate plant records is stressed.

New Filtration Plant at Waukegan, Illinois, Designed on Duplex Plan. Anon. *Water Works*, vol. 67, No. 3, March, 1928, pp. 97–102. (Abstract by C. R. Cox.)

This article is a description of a modern rapid sand filtration plant, with many interesting features, designed to filter Lake Michigan water. The plant is designed as two independent units with suitable cross connections to permit any one portion of one unit to be operated with the other portions of the other unit. A specially designed raw water aerator is used, which operates on the injector principle, whereby air is drawn through numerous tubes as the water flows by the ends of the tubes. The air is carried with the water to the bottom of a tank, and then rises to the surface, thus causing agitation of the water, which mixes the coagulant added just prior to aeration. The aerated water is then discharged into covered coagulating basins of 3½-hour capacity, and then to 10 rapid sand filter beds. The filters are conventional except for the underdrains. A cast-iron header is located in the front wall of each filter, and 20 bronze underdrains project across the bottom of each filter from these headers. The tubes are embedded in the furrows of a ridge and furrow concrete bottom, with ⅛-inch holes drilled on the upper side of the tubes, which are flush with the bottom of the furrows. Clear wells are located under each row of 5 filter beds. Duplicate chlorination equipment, with two machines in each unit, is used to chlorinate the filtered water flowing to duplicate, secondary aerators of the same design as the primary aerator. The chlorinated and aerated water then enters duplicate covered storage reservoirs with a 12-hour detention period. Provisions have been made for split or double chlorination in case this is found to be desirable.

The Effect of Slightly Alkaline Tap Water Upon Spawn and Eggs of Trout and Perch. Edward S. Hopkins. *Journal American Water Works Association*, vol. 19, No. 3, March, 1928, p. 313. (Abstract by J. H. O'Neill.)

The impossibility of hatching or raising brook or rainbow trout at the Druid Hill Tank hatchery, supplied with water from the city supply of Baltimore, Md., led to a study of the cause of the high mortality among the fish.

Experiments were made with three types of water: (*a*) The Baltimore water. alkaline, and with high oxygen content and no free carbon dioxide; (*b*) water from Lewiston, containing free carbon dioxide and high oxygen content; (*c*) a spring water containing free carbon dioxide and low oxygen content.

It was found that trout and perch would not live in water (*a*) but would live and thrive in the other two waters. When artificially carbonated to a pH value of about 6 to 7, water (*a*) was not detrimental to fish life. These experiments indicated that free carbon dioxide, regardless of the oxygen concentration, is necessary in water for the sustenance of fish life.

Saving and Keeping Elevated Water Storage Tanks or Towers and Standpipes in Sanitary Condition. D. W. Pyle. Proceedings of Ninth Texas Water Works Short School, January, 1927, pp. 219–220. (Abstract by H. D. Cashmore.)

Many tanks are lost through laxity in the proper and timely care of the surfaces. The surfaces should be cleaned by an electric wire brush and the paint supplied by a compressed-air spray.

The installation of a clean-out valve has the following advantages: (1) Sediment can be flushed out without emptying tank or removing it from service; (2) many tanks have the riser main extending up into the tank some distance, making it impossible to flush by draining without a clean-out valve; (3) cleaning by means of a flush valve prevents the contamination due to other methods.

The bottom of standpipes should be fitted with 3-inch or 4-inch valve and covered with a coat of rock asphalt or tar higher on the opposite side. This permits efficient flushing by the pressure of the water alone.

DEATHS DURING WEEK ENDED MAY 12, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended May 12, 1928, and corresponding week of 1927. (From the Weekly Health Index, May 16, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended May 12, 1928	Corresponding week, 1927
Policies in force	71, 171, 763	67, 645, 777
Number of death claims	15, 891	12, 728
Death claims per 1,000 policies in force, annual rate	11. 7	9. 8

Deaths from all causes in certain large cities of the United States during the week ended May 12, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 16, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended May 12, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended May 12, 1928 [2]
	Total deaths	Death rate [1]		Week ended May 12, 1928	Corresponding week, 1927	
Total (66 cities)	8, 762	15. 4	12. 9	906	780	75
Akron	46			6	5	65
Albany [3]	45	19. 5	17. 0	7	1	143
Atlanta	68	13. 9	16. 1	7	10	
White	33		12. 2	3	5	
Colored	35	(4)	25. 4	4	5	
Baltimore [3]	239	15. 0	14. 6	20	21	64
White	169		12. 6	13	13	52
Colored	70	(4)	26. 0	[illegible]	8	110
Birmingham	90	21. 2	13. 4	[illegible]	5	66
White	38		8. 2	3	3	41
Colored	52	(4)	21. 5	4	2	90
Boston	268	17. 5	17. 0	31	33	86
Bridgeport	39			4	1	73
Buffalo	157	14. 8	13. 3	12	21	52
Cambridge	42	17. 5	12. 2	6	3	107
Camden	24	9. 3	14. 1	5	3	80
Chicago [3]	925	15. 3	11. 1	115	72	99
Cincinnati	178	22. 5	17. 7	14	13	85
Cleveland	260	13. 5	9. 4	35	24	95
Columbus	83	14. 6	10. 7	8	4	75
Dallas	38	9. 1	10. 1	8	5	
White	29		9. 3	7	5	
Colored	9	(4)	15. 2	1	0	
Denver	85	15. 1	14. 6	9	4	
Des Moines	32	11. 0	12. 3	3	2	40
Detroit	392	14. 9	12. 0	52	46	80
Duluth	34	15. 2	11. 8	1	5	23
El Paso	30	13. 3	13. 8	11	12	
Erie	23			3	4	62
Fall River [3]	31	12. 1	10. 2	3	3	51
Flint	29	10. 2	9. 9	7	1	89
Fort Worth	44	13. 7	15. 9	3	9	
White	37		15. 2	3	8	
Colored	7	(4)	21. 3	0	1	
Grand Rapids	41	13. 1	10. 6	5	2	75
Houston	53			8	4	
White	40			6	1	
Colored	13	(4)		2	3	
Indianapolis	106	14. 5	13. 8	7	8	53
White	88		13. 6	6	4	52
Colored	18	(4)	15. 1	1	4	61
Jersey City	95	15. 3	13. 6	6	14	45
Kansas City, Kans	34	15. 0	12. 4	1	1	21
White	23		9. 7	1	0	25
Colored	11	(4)	24. 6	0	1	0
Kansas City, Mo	98	13. 1	14. 3	13	20	92
Knoxville	37	18. 4	13. 3	4	0	87
White	25		12. 8	2	0	48
Colored	12	(4)	17. 1	2	0	427

(Footnotes at end of table.)

Deaths from all causes in certain large cities of the United States during the week ended May 12, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 16, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended May 12, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended May 12, 1928
	Total deaths	Death rate		Week ended May 12, 1928	Corresponding week, 1927	
Los Angeles	342			30	25	86
Louisville	67	10.6	12.2	3	1	25
White	49		9.6	2	1	19
Colored	18	[4]	26.7	1	0	69
Lowell	33	15.6	10.9	8	5	63
Lynn	26	12.9	17.9	2	2	50
Memphis	65	17.9	20.1	5	6	59
White	30		12.2	1	3	19
Colored	35	[4]	34.5	4	3	125
Milwaukee	142	13.7	11.4	22	17	98
Minneapolis	110	12.6	9.2	6	9	36
Nashville	47	17.7	17.8	6	5	94
White	25		14.2	4	2	85
Colored	22	[4]	26.8	2	3	120
New Bedford	28	12.2	8.7	3	4	65
New Haven	80	22.3	11.0	4	5	56
New Orleans	152	18.5	20.8	14	23	68
White	82		15.1	6	7	44
Colored	70	[4]	36.9	8	16	116
New York	1,920	16.7	13.1	188	152	76
Bronx borough	250	13.7	10.6	25	13	76
Brooklyn borough	665	15.1	11.6	72	56	72
Manhattan borough	783	23.4	18.6	78	67	92
Queens borough	176	10.8	8.1	13	12	52
Richmond borough	46	16.0	14.2	0	4	0
Newark, N. J	119	13.1	9.6	10	11	51
Oakland	52	9.9	11.3	1	3	11
Oklahoma City	32			2	2	
Omaha	44	10.3	12.4	5	2	58
Paterson	41	14.8	10.2	4	2	69
Philadelphia	574	14.5	13.0	55	53	74
Pittsburgh	214	16.7	14.2	32	20	105
Portland, Oreg	58			3	6	32
Providence	64	11.7	9.1	6	10	52
Richmond	56	15.1	16.0	4	10	52
White	29		14.9	1	4	20
Colored	27	[4]	18.8	3	6	110
Rochester	93	14.8	14.1	12	13	97
St. Louis	301	18.6	12.9	18	7	60
Salt Lake City [3]	35	13.3	13.4	4	4	65
San Antonio	78	18.7	15.5	23	13	
San Diego	42	18.3	18.1	2	4	38
San Francisco	168	15.0	12.9	6	11	38
Schenectady	25	14.0	11.7	3	3	94
Somerville	24	12.2	7.2	4	0	138
Spokane	21	10.1	15.3	1	1	26
Springfield, Mass	47	16.4	14.5	6	7	95
Syracuse	75	19.7	9.3	9	3	109
Tacoma	21	9.9	11.2	1	2	26
Toledo	91	15.2	13.0	6	9	58
Trenton	44	16.6	18.3	3	6	51
Utica	29	14.6	12.1	3	2	68
Washington, D. C	172	16.3	11.5	12	5	68
White	107		9.0	6	3	50
Colored	65	[4]	18.8	6	2	111
Waterbury	26			6	0	174
Wilmington, Del	33	13.4	12.4	3	2	79
Worcester	57	15.1	15.5	8	2	97
Yonkers	29	12.5	9.7	4	2	91
Youngstown	38	11.4	10.8	5	2	67

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday May 11, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 19, 1928, and May 21, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 19, 1928, and May 21, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927
New England States:								
Maine	1	6	36	1	19	106	0	0
New Hampshire	2	--------	--------	--------	62	--------	0	--------
Vermont	--------	--------	--------	--------	23	153	0	0
Massachusetts	55	85	55	9	782	475	2	1
Rhode Island	8	8	--------	--------	247	--------	0	0
Connecticut	23	22	46	2	279	44	2	1
Middle Atlantic States:								
New York	338	481	[1] 94	[1] 17	4,129	907	25	6
New Jersey	128	140	46	4	1,952	111	4	1
Pennsylvania	128	167	--------	--------	2,895	663	3	3
East North Central States:								
Ohio	68	--------	119	--------	983	--------	3	--------
Indiana	12	16	66	8	680	209	0	0
Illinois	83	134	96	73	214	1,060	19	5
Michigan	86	82	4	4	1,129	263	7	3
Wisconsin	16	31	554	26	86	879	12	0
West North Central States:								
Minnesota	16	29	3	3	78	149	2	1
Iowa	--------	31	--------	--------	--------	281	--------	1
Missouri	88	33	34	8	521	192	21	5
North Dakota	1	7	30	--------	10	38	0	1
South Dakota	2	--------	1	1	21	65	3	0
Nebraska	8	1	1	--------	39	186	0	0
Kansas	8	6	--------	5	233	960	5	1
South Atlantic States:								
Delaware	--------	2	1	--------	40	21	0	0
Maryland [2]	40	43	14	10	760	21	2	0
District of Columbia	12	12	2	1	234	4	1	0
Virginia	--------	--------	--------	--------	--------	--------	--------	--------
West Virginia	7	16	319	80	107	157	1	0
North Carolina	11	10	--------	--------	1,054	1,613	3	0
South Carolina	9	11	474	478	247	228	0	0
Georgia	14	9	103	86	103	120	0	0
Florida	6	12	38	2	70	106	0	1

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 19, 1928, and May 21, 1927—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927
East South Central States:								
Kentucky	4		30		194		0	
Tennessee	9	4	222	20	185	88	1	1
Alabama	7	10	352	35	370	227	2	0
Mississippi	8	4					1	
West South Central States:								
Arkansas	2	5	227	54	306	78	0	0
Louisiana	13	11	37	6	231	45	1	0
Oklahoma [3]	10	3	180	23	233	301	4	0
Texas	16	15	31	45	103	198	0	0
Mountain States:								
Montana	2	3			10	17	1	0
Idaho	1	2			4	36	0	1
Wyoming					12	97	2	1
Colorado	12	4	1	1	139	150	1	0
New Mexico	4	2			149	124	0	0
Arizona		2			5	42	1	0
Utah [2]	2	8	12		3	20	0	0
Pacific States								
Washington	7	14			88	488	1	3
Oregon	7	9	10	13	29	308	2	1
California	101	113	43	22	120	1,638	6	4

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927
New England States:								
Maine	0	0	24	48	0	0	0	0
New Hampshire	0		3		0		0	
Vermont	0	0	6	3	0	0	0	0
Massachusetts	1	2	215	439	1	0	1	8
Rhode Island	0	1	28	18	0	0	2	0
Connecticut	0	1	132	99	4	0	0	0
Middle Atlantic States:								
New York	6	5	601	894	3	18	19	21
New Jersey	3	2	210	262	1	0	6	0
Pennsylvania	1	0	374	532	0	0	3	9
East North Central States:								
Ohio	2		195		31		4	
Indiana	0	0	70	107	133	98	1	2
Illinois	1	3	301	258	47	33	8	16
Michigan	1	0	265	247	20	43	3	9
Wisconsin	1	0	200	152	14	25	35	3
West North Central States:								
Minnesota	0	1	110	168	2	1	0	4
Iowa		0		33		6		1
Missouri	0	0	110	84	70	24	8	5
North Dakota	0	3	28	27	1	1	1	0
South Dakota	1	0	19	17	1	0	0	0
Nebraska	0	0	100	28	91	9	0	0
Kansas	1	1	122	66	69	11	4	6
South Atlantic States:								
Delaware	0	0	2	10	0	0	0	0
Maryland [2]	0	0	75	75	0	0	9	7
District of Columbia	0	0	43	13	0	6	0	0
Virginia								
West Virginia	0	0	21	50	48	28	4	11
North Carolina	0	0	24	18	76	44	4	9
South Carolina	0	1	4	5	13	25	22	39
Georgia	0	0	22	9	0	37	11	31
Florida	0	0	6	5	3	64	7	17

[2] Week ended Friday.
[3] Figures for 1927 are exclusive of Oklahoma City and Tulsa and for 1928 are exclusive of Tulsa only.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 19, 1928, and May 21, 1927—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927	Week ended May 19, 1928	Week ended May 21, 1927
East South Central States:								
Kentucky	0		38		21		3	
Tennessee	1	0	21	29	18	17	8	20
Alabama	1	0	6	8	10	27	5	21
Mississippi	0	0	14	6	2	43	4	12
West South Central States:								
Arkansas	0	0	31	2	5	2	2	13
Louisiana	0	2	7	8	50	4	11	18
Oklahoma [3]	0	0	33	23	80	36	3	28
Texas	0	0	87	8	48	47	1	6
Mountain States:								
Montana	0	0	19	31	16	3	0	3
Idaho	0	0	6	13	37	7	2	2
Wyoming	0	0	22	11	0	0	0	0
Colorado	0	0	77	97	2	1	2	1
New Mexico	0	1	18	9	7	0	1	0
Arizona	0	1	4	8	2	0	5	4
Utah [1]	0	0	6	34	13	4	0	0
Pacific States:								
Washington	0	0	27	35	36	42	1	5
Oregon	0	0	11	46	46	20	4	6
California	2	4	143	161	80	22	14	9

[1] Week ended Friday.
[3] Figures for 1927 are exclusive of Oklahoma City and Tulsa and for 1928 are exclusive of Tulsa only.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April, 1928										
Alabama	8	54	1,078	85	1,670	59	4	37	28	20
Arizona	8	38	130		131		1	29	86	6
Massachusetts	7	338	84		6,436	1	6	1,129	0	11
Michigan	0	232	51	2	6,376		2	1,094	141	23
New Hampshire	0	11	43				0	62	0	3
New Jersey	16	439	113		6,470		3	1,083	54	15
Vermont	0	4			282		1	40	0	16

April, 1928

	Cases
Anthrax:	
Massachusetts	1
New Jersey	1
Chicken pox:	
Alabama	225
Arizona	43
Massachusetts	655
Michigan	552
New Jersey	568
Vermont	121
Dysentery:	
Arizona	1
New Jersey	1
German measles:	
Massachusetts	73
New Jersey	647
Lead poisoning:	
Massachusetts	4
New Jersey	2
Lethargic encephalitis:	
Alabama	2
Massachusetts	6
Mumps:	
Alabama	142
Arizona	64
Massachusetts	998

April, 1928

	Cases
Mumps—Continued.	
Michigan	1,580
Vermont	193
Ophthalmia neonatorum:	
Massachusetts	135
New Jersey	3
Paratyphoid fever:	
New Jersey	2
Rabies in man:	
Alabama	1
New Jersey	1
Septic sore throat:	
Massachusetts	10
Michigan	15
Tetanus:	
Massachusetts	1
Trachoma:	
Arizona	37
Massachusetts	8
New Jersey	1
Whooping cough:	
Alabama	126
Arizona	10
Massachusetts	823
Michigan	574
New Jersey	548

ADMISSIONS TO HOSPITALS FOR THE INSANE, JANUARY, 1928

Reports for the month of January, 1928, showing new admissions to hospitals for the care and treatment of the insane have been received by the Public Health Service from 83 institutions located in 30 States, the District of Columbia, and the Territory of Hawaii. Sixteen of these institutions were corporate or private. These hospitals reported a total of 113,720 patients on January 31, 1928, including those on parole.

The following table shows the numbers of new admissions for the month of January, 1928, by psychoses.

First admissions to 83 hospitals for the insane, January, 1928

Psychoses	Male	Female	Total
Traumatic psychoses	7	0	7
Senile psychoses	114	85	199
Psychoses with cerebral arteriosclerosis	93	54	147
General paralysis	136	36	172
Psychoses with cerebral syphilis	29	27	56
Psychoses with Huntington's chorea	2	1	3
Psychoses with brain tumor	1	2	3
Psychoses with other brain or nervous disease	18	15	33
Alcoholic psychoses	64	10	74
Psychoses due to drugs and other exogenous toxins	8	6	14
Psychoses with pellagra	3	17	20
Psychoses with other somatic diseases	22	32	54
Manic-depressive psychoses	155	155	310
Involution melancholia	17	29	46
Dementia præcox (schizophrenia)	248	177	425
Paranoia and paranoid conditions	22	21	43
Epileptic psychoses	35	31	66
Psychoneuroses and neuroses	19	23	42
Psychoses with psychopathic personality	17	8	25
Psychoses with mental deficiency	51	35	86
Undiagnosed psychoses	140	44	184
Without psychosis	67	27	94
Total	1,268	835	2,103

Thirty-nine and seven-tenths per cent of the new admissions were females and 60.3 per cent were males, giving a ratio of 152 males per 100 females. The 83 institutions on January 31, 1928, had 59,973 male patients and 53,747 female patients, the ratio being 112 males per 100 females.

Undiagnosed psychoses constituted 8.7 per cent of the total admissions; dementia præcox, 20.2 per cent; manic-depressive psychoses, 14.7 per cent; senile psychoses, 9.5 per cent; general paralysis, 8.2 per cent; psychoses with cerebral arteriosclerosis, 7 per cent; and 4.5 per cent were recorded as without psychosis.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 101 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,650,000. The estimated population of the 95 cities reporting deaths is more than 30,960,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended May 5, 1928, and May 7, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
42 States	1,276	1,062	
101 cities	746	1,068	857
Measles:			
41 States	18,956	13,840	
101 cities	8,614	4,145	
Poliomyelitis:			
42 States	20	18	
Scarlet fever:			
42 States	3,950	4,828	
101 cities	1,560	2,142	1,256
Smallpox:			
42 States	876	699	
101 cities	84	130	117
Typhoid fever:			
42 States	157	268	
101 cities	38	57	48
Deaths reported			
Influenza and pneumonia:			
95 cities	1,405	839	
Smallpox:			
95 cities	1	0	
Terre Haute, Ind.	1	0	

City reports for week ended May 5, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	13	1	0	0	0	4	18	4
New Hampshire.									
Concord	[1] 22,546	0	0	0	0	0	0	0	0
Manchester	84,000	0	2	0	0	1	8	0	1
Vermont									
Barre	[1] 10,008	9	0	0	0	0	0	0	0
Massachusetts									
Boston	787,000	37	36	41	16	2	173	8	48
Fall River	131,000	3	3	1	0	0	1	0	2
Springfield	145,000	4	2	2	1	1	3	5	1
Worcester	193,000	4	4	1	1	0	13	10	5
Rhode Island									
Pawtucket	71,000	1	1	1	0	0	23	16	2
Providence	275,000	0	8	5	0	2	234	1	5
Connecticut									
Bridgeport	(2)	2	5	1	1	1	13	0	5
Hartford	164,000	6	5	5	0	1	53	14	5
New Haven	182,000	16	3	1	23	2	58	40	5
MIDDLE ATLANTIC									
New York									
Buffalo	544,000	6	9	20		0	87	33	23
New York	5,924,000	148	254	215	319	47	2,448	36	359
Rochester	321,000	6	9	2	1	1	56	19	8
Syracuse	185,000	15	5	0		0	208	11	7
New Jersey									
Camden	131,000	8	5	10	0	0	74	1	6
Newark	459,000	25	12	17	48	0	345	13	16
Trenton	134,000	6	3	2	1	0	8		3
Pennsylvania									
Philadelphia	2,008,000	66	70	57	0	6	1,301	48	71
Pittsburgh	637,000	20	17	25	3	3	104	48	46
Reading	114,000	8	3	1	0	0	21	2	3
EAST NORTH CENTRAL									
Ohio:							46	0	20
Cincinnati	411,000	9	7	7	0	5	94	103	32
Cleveland	960,000	53	22	36	38	6	110	10	5
Columbus	285,000	8	3	1	61	6	157	11	9
Toledo	295,000	12	4	0	6				
Indiana.							3	0	3
Fort Wayne	99,900	2	2	6	0		140	75	26
Indianapolis	367,000	35	3	5			1	0	5
South Bend	81,700	0	1	1			0	0	5
Terre Haute	71,900	4							
Illinois	[illegible]					20	31	20	122
Chicago	3,048,000					3	0	5	2
Springfield	64,700	56							
Michigan		1	72		8	6	645	24	59
Detroit	1,2[illegible]		0		0	1	120	39	4
Flint	136,[illegible]				0	2	20	13	8
Grand Rapids	156,00[illegible]	33	47	36					
		12	4	0					
		0	3	1					

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended May 5, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha	52,700	16	1	0	0	0	0	0	4
Milwaukee	517,000	53	11	8	5	4	4	19	26
Racine	69,400	2	1	2	13	2	0	1	2
Superior	[1] 39,671	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	5	0	0	0	2	0	0	2
Minneapolis	434,000	51	15	7	0	11	79	132	15
St. Paul	248,000	11	12	1	0	4	6	26	16
Iowa:									
Davenport	[1] 52,469	0	1	0	0		0	0	
Des Moines	146,000	0	2	1	0		0	0	
Sioux City	78,000	4	1	0	0		6	27	
Waterloo	36,900	11	0	1	0		2	10	
Missouri:									
Kansas City	375,000	14	5	3	0	3	31	83	13
St. Joseph	78,400	2	1	1	0	0	1	4	3
St. Louis	830,000	17	38	24	0	0	304	15	
North Dakota:									
Fargo	[1] 26,403	0	1	0	0	0	1	0	0
Grand Forks	[1] 14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	4	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	6	1	2	0	0	1	17	0
Omaha	216,000	6	2	2	0	0	0	5	10
Kansas:									
Topeka	56,500	15	0	1	6	6	3	4	2
Wichita	92,500	9	0	0	0	0	23	0	2
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	1	2	0	0	0	8	4	6
Maryland:									
Baltimore	808,000	71	23	27	7	4	604	43	35
Cumberland	[1] 33,741	0	0	0	0	0	1	0	0
Frederick	[1] 12,035	0	0	1	0	0	40	0	2
District of Columbia:									
Washington	528,000	11	12	14	4	3	215	0	16
Virginia:									
Lynchburg	30,500	2	0	2	0	0	41	4	1
Norfolk	174,000	14	0	0	0	0	34	2	6
Richmond	189,000	2	2	1	0	3	133	2	8
Roanoke	61,900	9	0	0	0	0	22	1	2
West Virginia:									
Charleston	50,700	2	0	0	0	0	0	0	1
Wheeling	[1] 56,208	7	1	0	1	0	9	0	2
North Carolina:									
Raleigh	[1] 30 [illegible]	0	0	1	0	0	28	0	1
Wilmington	[illegible]	7	1	0	0	0	4	0	1
Winston-Salem	[illegible] 800	13	1	0	0	0	29	18	2
South Carolina:									
Charleston	74,100	0	0	0	11	1	0	0	2
Columbia	41,800	11	0	1	0	0	6	31	1
Greenville	[1] 27,311	0	0	0	0	0	1	3	0
Georgia:									
Atlanta	([2])	6	1	1	27	1	23	6	16
Brunswick	[1] 16,809	0	0	0	0	0	1	0	0
Savannah	94,900	1	0	0	9	0	1	1	3
Florida:									
Miami	[1] 69,754	21	1	6	0	0	9	5	2
St. Petersburg	[1] 26,847		0			0			0
Tampa	102,000	3	0	2	0	[illegible]	3	2	0

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended May 5, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST SOUTH CENTRAL									
Kentucky									
Covington	58,500	0	1	1	0	1	1	0	2
Louisville	311,000	0	3	3	5	1	140	10	11
Tennessee:									
Memphis	177,000	12	2	3	0	4	11	11	4
Nashville	137,000	1	1	1	0	4	24	2	6
Alabama									
Birmingham	211,000	9	1	0	30	6	37	2	18
Mobile	66,800	0	0	0	1	0	4	0	0
Montgomery	47,000	9	0	0	2		10	1	
WEST SOUTH CENTRAL									
Arkansas									
Fort Smith	[1] 31,643	2	0	1	0		3	0	
Little Rock	75,900	3	0	0	7	0	7	7	
Louisiana									
New Orleans	419,000	1	7	9	2	4	2	0	10
Shreveport	59,500	0	0	1	0	0	11	0	3
Oklahoma									
Oklahoma City	(2)	7	0	3	43	2	14	7	7
Tulsa	133,000	14	0	1	0		12	19	
Texas									
Dallas	203,000	14	3	1	2	1	18	0	3
Fort Worth	159,000	17	1	2	0	2	4	5	3
Galveston	49,100	0	0	0	0	0	0	0	1
Houston	[1] 164,954	1	3	4	1	1	49	0	4
San Antonio	205,000	0	1	4	0	0	8	0	0
MOUNTAIN									
Montana									
Billings	[1] 17,971	2	1	0	0	0	0	0	0
Great Falls	[1] 29,883	13	1	0	0	1	2	0	2
Helena	[1] 12,037	0	0	0	0	0	0	0	0
Missoula	[1] 12,668	2	0	0	0	0	0	1	0
Idaho									
Boise	[1] 23,042	11	0	0	0	0	0	1	0
Colorado									
Denver	285,000	59	11	6		2	82	72	14
Pueblo	43,900	0	1	0	0	0	0	0	0
New Mexico									
Albuquerque	[1] 21,000	10	1	0	0	0	9	0	0
Utah									
Salt Lake City	133,000	15	3	3	0	1	1	1	2
Nevada									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	66	5	4	0		56	9	
Spokane	109,000	7	2	0	0		0	0	
Tacoma	106,000	8	1	0	0	0	11	46	1
California:									
Los Angeles	(2)	103	40	35	22	2	13	50	13
Sacramento	73,400	8	2	1	0	0	4	6	3
San Francisco	567,000	83	18	9	1	0	29	37	5

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended May 5, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	2	0	0	0	0	0	1	1	4	18
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	11
Manchester	2	6	0	0	0	1	0	0	0	0	19
Vermont:											
Barre	0	1	0	0	0	0	0	0	0	0	1
Massachusetts:											
Boston	64	87	0	0	0	26	1	0	0	35	302
Fall River	4	8	0	0	0	6	0	0	0	0	34
Springfield	6	18	0	0	0	2	0	0	0	6	40
Worcester	10	5	0	0	0	4	0	0	0	4	67
Rhode Island:											
Pawtucket	1	3	0	0	0	1	0	0	0	1	14
Providence	9	21	0	0	0	6	0	0	0	4	61
Connecticut:											
Bridgeport	11	1	0	0	0	0	0	0	0	2	35
Hartford	5	2	0	0	0	0	0	0	0	5	52
New Haven	8	2	0	0	0	1	0	0	0	18	30
MIDDLE ATLANTIC											
New York:											
Buffalo	19	40	0	0	0	13	0	0	0	26	146
New York	279	372	0	0	0	136	10	4	1	164	1,941
Rochester	15	6	0	0	0	1	0	0	0	5	70
Syracuse	9	10	0	0	0	1	1	0	0	18	60
New Jersey:											
Camden	6	4	0	0	0	2	0	0	0	5	40
Newark	27	48	0	0	0	7	0	0	0	14	119
Trenton	3	2	0	1	0	4	0	0	0	0	44
Pennsylvania:											
Philadelphia	90	89	1	0	0	40	4	2	0	77	603
Pittsburgh	28	27	0	0	0	14	0	2	0	22	216
Reading	3	23	0	0	0	0	0	0	0	6	30
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	20	33	2	3	0	15	1	1	0	13	169
Cleveland	39	22	0	1	0	25	1	1	0	56	231
Columbus	8	8	2	0	0	8	0	0	0	1	104
Toledo	13	2	3	0	0	6	0	0	0	16	91
Indiana:											
Fort Wayne	5	5	2	0	0	3	0	0	0	0	37
Indianapolis	9	16	12	2	0	1	0	0	0	10	109
South Bend	4	1	1	0	0	1	0	0	0	1	23
Terre Haute	3	0	1	2	1	0	0	0	0	3	24
Illinois:											
Chicago	117	77	2	3	0	66	3	2	0	90	880
Springfield	3	12	0	4	0	1	0	0	0	0	21
Michigan:											
Detroit	89	139	2	2	0	27	2	0	1	77	366
Flint	6	8	1	6	0	3	0	0	0	3	39
Grand Rapids	7	3	1	0	0	0	1	0	0	7	56
Wisconsin:											
Kenosha	3	1	1	0	0	1	0	0	0	10	13
Milwaukee	26	49	1	0	0	8	1	1	1	17	167
Racine	4	4	1	0	0	1	0	0	0	0	24
Superior	2	10	1	0	0	1	0	0	0	0	15
WEST NORTH CENTRAL											
Minnesota:											
Duluth	7	2	1	0	0	1	0	1	0	3	33
Minneapolis	44	12	5	0	0	3	0	0	0	15	119
St. Paul	24	12	3	1	0	7	0	0	0	30	81
Iowa:											
Davenport	1	3	3	0			0	0		0	
Des Moines	6	2	2	17			0	0		0	
Sioux City	2	1	2	1			0	0		1	
Waterloo	1	5	0	0			0	0		0	

City reports for week ended May 5, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST NORTH CENTRAL—continued											
Missouri:											
Kansas City	10	34	2	0	0	6	0	0	0	7	100
St. Joseph	3	8	1	3	0	0	0	0	0	1	13
St. Louis	34	19	4	1	0	15	1	0	0	26	265
North Dakota:											
Fargo	2	0	0	0	0	0	0	0	0	5	34
Grand Forks	0	3	0	0	-------	-------	0	0	-------	0	-------
South Dakota:											
Aberdeen	2	0	0	0	-------	-------	0	0	-------	0	-------
Nebraska:											
Lincoln	1	17	0	1	0	0	0	0	0	3	25
Omaha	4	8	8	2	0	2	0	0	0	0	59
Kansas:											
Topeka	2	9	1	3	0	1	0	0	0	5	38
Wichita	2	2	1	5	0	0	0	0	0	3	32
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	1	0	0	0	0	1	0	1	1	44
Maryland:											
Baltimore	34	35	0	0	0	15	2	1	0	46	247
Cumberland	1	1	0	0	0	1	0	0	0	9	14
Frederick	0	0	0	0	0	0	0	0	0	0	2
Dist. of Columbia:											
Washington	23	43	1	1	0	12	1	0	0	6	138
Virginia:											
Lynchburg	0	1	0	0	0	1	1	1	0	13	11
Norfolk	1	2	0	0	0	1	0	1	0	4	-------
Richmond	4	2	0	0	0	1	0	0	0	0	59
Roanoke	0	0	1	0	0	0	0	0	0	5	20
West Virginia:											
Charleston	2	1	0	0	0	3	0	0	0	0	18
Wheeling	1	0	0	0	0	2	1	0	0	0	20
North Carolina:											
Raleigh	0	2	0	2	0	0	0	0	0	7	13
Wilmington	0	0	0	0	0	0	0	0	0	0	11
Winston-Salem	1	0	5	0	0	0	1	2	0	0	16
South Carolina:											
Charleston	0	0	0	1	0	0	0	0	0	0	16
Columbia	0	1	0	1	0	1	0	0	0	0	10
Greenville	0	1	1	0	0	0	0	1	0	2	9
Georgia:											
Atlanta	3	9	5	2	0	7	0	1	0	2	100
Brunswick	0	0	0	0	0	0	0	0	0	0	5
Savannah	0	0	1	1	0	3	1	1	0	1	29
Florida:											
Miami	0	0	1	0	0	2	1	2	0	8	27
St. Petersburg	0	-------	0	-------	0	0	0	-------	0	-------	9
Tampa	1	1	0	0	0	4	1	2	0	0	23
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	9	0	0	0	0	1	0	0	0	14
Louisville	7	40	1	1	0	10	1	0	0	0	92
Tennessee:											
Memphis	5	9	3	0	0	3	1	0	0	1	51
Nashville	2	0	0	1	0	1	0	0	0	4	50
Alabama:											
Birmingham	1	1	6	1	0	7	1	0	0	7	94
Mobile	0	2	0	0	0	1	0	0	0	0	19
Montgomery	0	0	1	0	-------	-------	0	0	-------	3	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0	-------	-------	1	0	-------	1	-------
Little Rock	0	11	0	0	0	0	1	0	0	0	-------
Louisiana:											
New Orleans	5	7	0	0	0	13	2	5	0	2	155
Shreveport	0	0	1	1	0	0	1	0	1	2	33

City reports for week ended May 5, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL—con.											
Oklahoma:											
Oklahoma City	1	18	2	17	0	4	0	0	0	0	28
Tulsa	2	16	2	0	-------	-------	0	0	-------	4	-------
Texas:											
Dallas	2	17	4	6	0	4	0	0	0	28	58
Fort Worth	1	11	4	8	0	1	0	1	0	0	28
Galveston	0	0	0	0	0	1	1	1	0	0	13
Houston	1	2	1	2	0	5	0	1	0	0	72
San Antonio	1	0	0	0	0	0	0	0	0	0	-------
MOUNTAIN											
Montana:											
Billings	1	0	1	0	0	0	0	0	0	5	13
Great Falls	1	0	1	3	0	0	0	0	0	0	7
Helena	0	4	1	2	0	0	0	0	0	0	10
Missoula	1	1	0	0	0	1	0	0	0	0	8
Idaho:											
Boise	1	0	1	0	0	0	0	0	0	3	9
Colorado:											
Denver	12	25	1	1	0	14	0	0	1	32	95
Pueblo	1	0	0	0	0	2	0	0	0	0	6
New Mexico:											
Albuquerque	1	3	0	0	0	2	0	0	0	0	10
Utah:											
Salt Lake City	2	1	1	6	0	1	0	0	0	14	32
Nevada:											
Reno	0	0	1	0	0	0	0	0	0	0	6
PACIFIC											
Washington:											
Seattle	8	8	2	0	-------	-------	0	2	-------	0	-------
Spokane	5	3	5	6	-------	-------	0	0	-------	1	-------
Tacoma	3	5	4	0	0	0	0	1	0	2	16
California:											
Los Angeles	24	14	6	3	0	21	2	2	0	62	161
Sacramento	1	4	1	0	0	2	0	0	0	1	35
San Francisco	15	26	2	3	0	12	1	1	0	13	161

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	1	0	0	1	1	1	0	0
Rhode Island:									
Providence	0	1	0	0	0	0	0	0	0
Connecticut:									
Bridgeport	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	52	16	5	2	0	0	1	2	0
New Jersey:									
Newark	3	3	1	6	0	0	0	1	0
Trenton	1	1	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	1	1	0	1	0	1	0	0	0
Pittsburgh	1	0	0	0	0	0	0	0	0

City reports for week ended May 5, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	2	0	0	0	0	0	0	0	0
Cleveland	3	0	0	0	0	0	0	0	0
Columbus	1	1	0	0	0	0	0	0	0
Toledo	3	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	0	3	0	0	0	0	0	0	0
Illinois:									
Chicago	8	1	1	0	0	0	0	0	0
Michigan:									
Detroit [1]	2	0	1	0	0	0	0	1	0
Wisconsin:									
Racine	0	1	1	1	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	2	0	0	0	0	0	0	0	0
Minneapolis	2	0	1	0	0	0	0	1	0
St. Paul	1	0	0	0	0	0	0	0	0
Iowa:									
Des Moines	1	0	0	0	0	0	0	0	0
Missouri:									
Kansas City	4	0	0	0	0	0	0	0	0
St. Louis	6	2	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	1	0	0	0	0	0	0	0
Kansas:									
Topeka	0	0	0	1	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	0	1	0	0	0	0	0
District of Columbia:									
Washington	0	0	1	1	0	0	0	0	0
Virginia:									
Norfolk	0	0	0	0	1	0	0	0	0
North Carolina:									
Raleigh	0	0	0	0	0	1	0	0	0
South Carolina:									
Columbia	0	0	0	0	0	1	0	0	0
Greenville	0	0	0	0	0	1	0	0	0
Georgia:									
Savannah	0	0	0	0	1	0	0	0	0
Florida:									
Miami	0	0	0	0	0	0	0	1	0
Tampa	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Birmingham	0	0	0	0	3	3	0	0	0
Montgomery	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	1	0	0	0
Louisiana:									
New Orleans	0	0	0	0	2	0	0	0	0
Shreveport	0	0	0	0	0	1	0	0	0
Oklahoma:									
Oklahoma City	0	1	0	0	0	0	0	0	0
Tulsa	1	0	0	0	0	0	0	0	0
Texas:									
Houston	0	1	0	0	0	1	0	0	0

[1] Rabies (in man): 1 death at Detroit, Mich.

City reports for week ended May 5, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
MOUNTAIN									
Montana:									
Billings	1	0	0	0	0	0	0	0	0
Colorado:									
Denver	3	2	0	0	0	0	0	0	0
Pueblo	0	1	0	1	0	0	0	0	0
Utah:									
Salt Lake City	3	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Tacoma	1	0	0	0	0	0	0	0	0
California:									
Los Angeles	1	0	0	0	0	0	0	1	0
San Francisco	0	0	0	0	1	0	0	0	

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended May 5, 1928, compared with those for a like period ended May 7, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, April 1 to May 5, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927
101 cities	132	200	144	174	137	179	[2] 129	171	123	183
New England	126	181	168	105	131	135	133	95	133	130
Middle Atlantic	188	269	209	271	204	270	172	242	170	272
East North Central	121	169	116	135	116	131	[3] 132	137	107	159
West North Central	101	170	101	109	80	141	84	158	78	131
South Atlantic	88	117	82	141	82	135	86	105	88	119
East South Central	25	66	40	86	40	30	[4] 58	76	40	76
West South Central	132	335	160	141	124	124	100	178	80	141
Mountain	44	170	133	108	80	188	133	99	80	152
Pacific	77	125	74	115	102	157	56	188	125	110

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1928 and 1927, respectively.
[2] Superior, Wis., and Louisville, Ky., not included.
[3] Superior, Wis., not included.
[4] Louisville, Ky., not included.

Summary of weekly reports from cities, April 1 to May 5, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued.

MEASLES CASE RATES

	Week ended—									
	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927
101 cities	1,277	867	1,340	766	1,362	788	[2] 1,285	638	1,423	696
New England	1,874	270	1,726	223	1,743	295	1,593	323	1,322	270
Middle Atlantic	1,504	159	1,739	172	1,824	145	1,862	231	2,266	212
East North Central	1,034	957	998	885	817	797	[3] 731	637	794	564
West North Central	762	1,300	861	1,314	986	1,552	1,017	1,225	888	1,522
South Atlantic	2,285	936	2,115	1,311	2,358	1,589	1,767	1,017	2,109	1,577
East South Central	958	608	1,117	396	1,536	517	[4] 1,345	375	1,132	517
West South Central	436	2,114	428	1,005	380	1,249	396	922	392	877
Mountain	708	2,788	743	2,080	761	1,793	840	1,542	752	1,632
Pacific	447	3,051	524	2,207	393	2,103	386	1,528	266	1,601

SCARLET FEVER CASE RATES

101 cities	273	394	226	391	264	362	[2] 265	339	258	360
New England	331	367	301	423	264	346	329	402	345	393
Middle Atlantic	366	594	273	581	287	528	312	446	303	540
East North Central	252	272	194	285	272	298	[3] 277	289	254	283
West North Central	263	433	277	396	288	342	275	333	218	271
South Atlantic	179	177	154	150	170	161	214	191	175	128
East South Central	100	177	234	218	200	167	[4] 167	193	304	183
West South Central	148	99	128	50	164	41	108	33	148	58
Mountain	239	941	239	950	212	932	203	950	274	1,004
Pacific	133	243	123	243	151	209	110	198	153	212

SMALLPOX CASE RATES

101 cities	18	26	20	24	22	33	[2] 25	21	14	22
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	24	37	24	32	31	29	[3] 28	33	15	28
West North Central	84	42	49	55	60	40	68	38	31	34
South Atlantic	14	25	11	27	12	65	33	18	14	36
East South Central	10	86	35	96	20	162	[4] 102	66	15	56
West South Central	4	103	16	87	8	95	28	25	36	33
Mountain	106	27	150	27	168	54	150	9	106	36
Pacific	18	55	74	26	59	97	43	65	31	73

TYPHOID FEVER CASE RATES

101 cities	4	8	5	8	6	7	[2] 4	8	6	10
New England	2	7	9	9	7	0	5	5	2	2
Middle Atlantic	1	6	5	5	6	7	3	5	4	10
East North Central	3	5	1	1	3	3	[3] 2	6	3	7
West North Central	6	2	8	12	6	4	6	4	2	2
South Atlantic	12	9	4	13	9	11	7	16	18	18
East South Central	15	35	20	35	15	30	[4] 7	30	0	15
West South Central	16	37	20	17	20	12	24	12	28	37
Mountain	0	0	0	9	0	27	0	9	0	18
Pacific	8	8	3	18	3	10	0	18	15	3

[2] Superior Wis., and Louisville, Ky., not included.
[3] Superior, Wis., not included.
[4] Louisville, Ky., not included.

Summary of weekly reports from cities, April 1 to May 5, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued.

INFLUENZA DEATH RATES

	Week ended—									
	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927
95 cities	34	23	30	21	28	18	[2] 32	18	32	13
New England	16	7	9	16	7	12	14	7	21	5
Middle Atlantic	31	26	27	21	26	20	34	21	28	15
East North Central	40	9	27	11	28	11	[3] 30	10	36	7
West North Central	16	17	24	12	41	21	31	12	53	8
South Atlantic	19	40	30	38	16	22	30	29	21	16
East South Central	73	74	84	90	68	58	[4] 55	37	84	43
West South Central	107	51	90	42	45	30	37	47	25	13
Mountain	80	36	53	18	53	0	44	9	35	9
Pacific	7	17	14	14	14	10	17	21	7	21

PNEUMONIA DEATH RATES

	Apr. 7, 1928	Apr. 9, 1927	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927
95 cities	215	162	207	153	198	159	[2] 198	143	206	131
New England	179	140	177	156	166	151	138	184	189	140
Middle Atlantic	244	198	243	175	242	199	246	168	264	166
East North Central	241	131	199	141	192	135	[3] 214	128	211	121
West North Central	122	137	175	128	155	124	90	56	128	68
South Atlantic	179	150	209	184	181	179	172	153	184	114
East South Central	397	218	183	138	235	160	[4] 226	133	214	149
West South Central	185	140	238	76	197	81	189	123	90	115
Mountain	97	242	186	152	106	161	106	188	159	99
Pacific	105	117	88	117	81	97	125	117	74	79

[2] Superior, Wis., and Louisville, Ky., not included.
[3] Superior, Wis., not included.
[4] Louisville, Ky., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1927 and 1928, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central	12	10	2,683,500	2,634,500	2,566,400	2,518,500
South Atlantic	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central	7	6	1,048,300	1,028,300	1,000,100	980,700
West South Central	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain	9	9	591,100	581,600	591,100	581,600
Pacific	6	4	2,046,400	1,996,400	1,548,900	1,512,100

FOREIGN AND INSULAR

SMALLPOX ON VESSEL

Steamship "Yarmouth"—At Kingston, Jamaica, from Boston via ports—April 7, 1928.—During the week ended April 7, 1928, the steamship *Yarmouth* from Boston, via Miami, April 2, and Habana, April 4, 1928, arrived at Kingston, Jamaica, with a case of smallpox on board. The *Yarmouth* sailed from Kingston April 7, for New York, arriving April 12, 1928.

THE FAR EAST

Report for the week ended April 21, 1928.—The following report for the week ended April 21, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt—Suez
Aden Protectorate—Aden, Perim
India—Bassein, Bombay, Rangoon
Siam—Bangkok

CHOLERA

India—Bassein, Calcutta, Madras, Moulmein, Rangoon, Tuticorin
French India—Pondicherry
Siam—Bangkok
French Indo China—Saigon

SMALLPOX

India—Bombay, Calcutta, Madras, Moulmein, Rangoon, Tuticorin, Vizagapatam.
French India—Pondicherry
Straits Settlements—Singapore
China—Shanghai, Hong Kong
Japan—Osaka, Shimonoseki
Kwantung—Dairen
South Manchuria—Changchun
Manchuria—Mukden, Antung
Chosen—Fusan

Returns for the week ended April 21 were not received from Samarinda, Dutch East Indies, Basra, Iraq, nor Vladivostok, Union of Soviet Socialist Republics.

CANADA

Provinces—Communicable diseases—Week ended April 28, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended April 28, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Influenza	10					11		30
Poliomyelitis				3				3
Smallpox				18		15	3	36
Typhoid fever	4	1	26	1	3	1	5	41

Quebec—Communicable diseases—Week ended May 5, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended May 5, 1928, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Scarlet fever	110
Chicken pox	25	Smallpox	33
Diphtheria	27	Tuberculosis	80
German measles	13	Typhoid fever	12
Influenza	9	Whooping cough	8
Measles	216		

CZECHOSLOVAKIA

Communicable diseases—March, 1928.—During the month of March, 1928, communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	17	12	Rabies	1	1
Diphtheria	908	67	Scarlet fever	1,145	47
Dysentery	10	3	Trachoma	248	
Malaria	10		Typhoid fever	535	43
Paratyphoid fever	5		Typhus fever	25	
Puerperal fever	79	28			

DENMARK

Communicable diseases—February, 1928.—During the month of February, 1928, communicable diseases were reported in the Kingdom of Denmark as follows:

Disease	Cases	Disease	Cases
Broncho-pneumonia	2,932	Paratyphoid fever	11
Cerebrospinal meningitis	3	Pneumonia	480
Chicken pox	60	Poliomyelitis	2
Diphtheria	680	Puerperal fever	14
Erysipelas	294	Scarlet fever	242
Influenza	4,934	Tetanus	5
Jaundice	192	Tuberculosis	209
Lethargic encephalitis	12	Typhoid fever	9
Measles	6,694	Whooping cough	1,767
Mumps	752		

Population of Denmark: 3,493,000.

FINLAND

Communicable diseases—February, 1928.—During the month of February, 1928, communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	80	Scarlet fever	199
Influenza	3,702	Smallpox	1
Paratyphoid fever	40	Typhoid fever	49
Poliomyelitis	1		

Population: 3,558,220.

Helsingfors.—During the period under report, cases of communicable diseases were reported in the city of Helsingfors as follows: Diphtheria, 6; influenza, 874; paratyphoid fever, 3; scarlet fever, 54. (Population, 215,829.)

ITALY

Communicable diseases—January 30–February 12, 1928.—During the period January 30 to February 12, 1928, communicable diseases were reported in the Kingdom of Italy as follows:

Disease	Jan. 30–Feb. 5, 1928		Feb. 6–12, 1928	
	Cases	Communes affected	Cases	Communes affected
Anthrax	16	16	19	18
Cerebrospinal meningitis	6	4	8	8
Chicken pox	312	121	426	126
Diphtheria	439	266	469	288
Dysentery	2	2	6	4
Lethargic encephalitis	4	4	6	6
Measles	2,791	336	2,859	324
Poliomyelitis	5	5	12	12
Scarlet fever	329	189	342	138
Smallpox	2	2	2	2
Typhoid fever	353	189	360	203

JAMAICA

Smallpox (Alastrim)—March 25–April 28, 1928.—During the period March 25 to April 28, 1928, 11 cases of smallpox (alastrim) were reported in the island of Jamaica, occurring in localities not included in the Kingston area.

Communicable diseases.—During the same period other communicable diseases were reported in the island as follows:

Disease	Cases		Disease	Cases	
	Kingston	Other localities		Kingston	Other localities
Cerebrospinal meningitis		1	Leprosy		1
Chicken pox	3	53	Puerperal fever		1
Dysentery	6	34	Tuberculosis	24	57
Erysipelas		1	Typhoid fever	28	87

Population: Kingston, 62,707; island, 926,000.

MALTA

Communicable diseases—March, 1928.—During the month of March, 1928, communicable diseases were reported in the island of Malta as follows:

Disease	Cases	Disease	Cases
Broncho-pneumonia	19	Puerperal fever	3
Cerebrospinal meningitis	1	Scarlet fever	6
Chicken pox	36	Trachoma	41
Diphtheria	4	Tuberculosis	28
Erysipelas	6	Typhoid fever	20
Influenza	28	Undulant (Malta) fever	48
Malaria	[1] 1	Whooping cough	6
Pneumonia	8		

[1] Contracted abroad.

Population, civil, 228,575.

Mortality from communicable diseases—March, 1928.—During the period under report mortality from communicable diseases was reported in the island of Malta as follows: Diphtheria, 1 death; tuberculosis, 13; typhoid fever, 3.

MEXICO

State of Jalisco—Smallpox—March and April, 1928.—An epidemic of smallpox in March and April, 1928, was reported from unofficial sources in the Los Altos region, State of Jalisco, Mexico. The disease is said to have been severe in Tepatitlan.

SYRIA

Beirut and the Lebanon—Smallpox—April 2-15, 1928—Summary.—During the period April 2 to 15, 1928, 8 new cases of smallpox were reported at Beirut, Syria, and 4 cases at other localities in the Lebanon. The total number of cases reported from January 26 to April 17, 1928, was for Beirut 106, and for other localities in the Lebanon 63 cases.

UNION OF SOUTH AFRICA

Orange Free State—Smallpox—Typhus fever.—During the week ended March 31, 1928, fresh outbreaks of smallpox and typhus fever were reported in the Orange Free State, occurring on farms in the Koffefontein and Ladysmith Districts, respectively.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928		February, 1928				March, 1928					April, 1928			
								21	28	4	11	18	25	3	10	17	24	31	7	14	21	28
China:																						
Amoy	C	28	72	16																		
	D	7	3																			
Canton	C	31	36	14	12	1											1	1				
	D	16	25	14	11	1											1	1				
Foochow	C	P	P	P																		
Hong Kong	C	P	1	P																		
Shanghai (settlement and concession)—																						
Foreigners only	C	1	6	3																		
Including natives	D	20	74	7																		
Swatow	C	42	P	P	P																	
	D		P	P	P																	
Tientsin	C	P	15	2	P	1																
Dutch East Indies: Java—Batavia	C				28	3																
	D				18	3																
India	C	45,163	31,390	20,160	23,047	25,139	15,377	3,267	3,097	3,026	3,001	2,865	3,047	3,256	4,068							
	D	22,051	15,895	10,371	12,863	15,026	8,863	1,765	1,739	1,684	1,562	1,529	1,686	1,755	2,312							
Bassein	D									1			1	1			4	25	22	20	6	6
Bombay	C	42	3		2				1						1	1		1				
	D	30	2		2										1	1		1				
Calcutta	C	87	76	101	199	428	176	39	36	70	58		80	99	162	164	190	148				
	D	40	39	64	138	281	125	18	24	38	32	35	42	63	101	94	122	114	112	111	97	105
Madras	C	547	59	14	13	1	1	1			1		3	11			7	1	2	5		
	D	278	48	8	7	2	1		3		1	2	2	7	7		2	1	1	4	5	4
Madras Presidency	C	7,660	3,056	2,050	3,073	3,702	1,864	1,163	1,301	1,305	912	930	839	621	571							
	D	3,513	1,581	1,055	1,736	2,104	984	623	813	726	498	504	457	357	300							
Negapatam	C							4														
	D							4	1		1	2	2							1		
Rangoon	C	1	2	6	2	8	4	4		1	1	10	12	3	4	4	7	8	3			
	D	1	2	5	5	6	3			1	1	8	4	2	4	2	3	6	5	2	7	6
Tuticorin	C			1		8													10	43	45	19
	D			1	37	14										1			8	26	32	10

India (French):																						
Chandernagor	C	1	1		6	10	14	1		5		2	2		1	2						
	D	1			6	10	9			1		2	2		1	1						
Karikal	C	18	1		1	1	8	9	7	8	8	2	2	2								
	D	12	1		1	1	4	5	4	5	5	2	1	2								
Pondicherry	C	12	15		1	25	11	2	3	2	5	17	10	6					1	2	3	
	D	11	15		1	21	12	2	3	2	3	12	4	3					1	2	3	
Indo-China:[1] Saigon	C		1	1			3	1	1		2	1	5	2	8	27	13	21	35	50	28	
	D						1				1	1	1		6	19	8	12	20	37	17	
Iraq[2]																						
Kwangchow-wan[1]																						
Philippine Islands: Manila	C	1																				
Siam	C	77	40	18	110	88	110	50	33	48	69	74	59	84	78	53	88			24		
	D	53	24	11	76	64	80	34	21	42	42	50	38	73	53	39	67			17		
Bangkok	C	2	3	5	4	3	21	11	28	28	34	23	17	12	8	8	12	16	24		30	24
	D	1	1	3	2	2	11	7	16	26	17	12	11	7	6	5	5	12	11		13	14
Straits Settlements: Singapore	C				7	5	23	2			1					1	1					1
	D				5	4	12	1								1	1					1
On vessel:																						
S. S. Adrastus: At Yokohama, Japan	C	1																				
	D	1																				
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C																		P			
S. S. Tabaristan: At Basra, Iraq	C			1																		

[1] See 10-day table below.

[2] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Dulaim Liwa, 100 cases, 69 deaths; Hillah Liwa, 106 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

Place		July-September, 1927	October, 1927	November, 1927			December, 1927			January, 1928			February, 1928			March, 1928			April, 1928	
				1-10	1-10	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20
Indo-China (French):																				
Annam	C	3,179	226	13	75	38	16	2		79	95	93	23	36	14	18	18	23	17	11
Cambodia	C	251	180	56	1	28	21	12	39	30	9	15	38	22	51	33	22	92	43	102
Cochin-China	C	469	178	21	27	52	17	38	58	46	119	130	178	113	153	206	217	245	277	316
Laos	C	246	67	10																
Tonkin	C	1,297	1			1			2	1									1	4
Kwangchow-Wan	C	16																		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept 25–Oct. 22, 1927	Oct 23–Nov. 19, 1927	Nov 20–Dec 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended– January, 1928 21	28	February, 1928 4	11	18	25	March, 1928 3	10	17	24	31	April, 1928 7	14	21	28	May 4, 1928
Algeria: [1] Oran	C	1		2																		
	D	1																				
Arabia: Aden	C					19	13	22	54	89	63	45	77	158	189	148	151	163	108	59	34	
	D					7	8	8	33	55	50	31	26	99	134	135	134	126	97	48	30	
Argentina:																						
Bahia Blanca district	C				3																	
Buenos Aires	C									2												
Cordoba Province	C		P	P	10	2													5			
Firmat	C				1																	
Quilino	C				3																	
Rosario	C				4	5		4			1											
Santiago Province	C										1											
Ucacha	C				1																	
Azores: St. Michaels Island	C	2	3	3	3	2	3	1	2	2	1	1	1		1	1		1		2		
	D	1	1		1	1	1	1	1	1			1		1			1		1		
Brazil:																						
Bahia	C					4	2		2	1	4	4					P	2				
	D					4		1	2	1	2	3										
Porto Alegre	C												2									
Rio de Janeiro	C						1		1	2	1	1		1	2	1						
	D									1	2				2	1						
	D									1	2				2							
British East Africa: [1]																						
Tanganyiki	C		P	P	P	P			2				3									
	D								2				3									
Uganda	C	226	99	99	67	79	16			7	13											
	D	158	88	96	61	64	12			6	10											
*Canary Islands:																						
Las Palmas	C		9		3	3	1				1				2		2					
	D				1	1	1				1											
Teneriffe	C						1	3	3	3												
	D						1		3													
Ceylon: Colombo	C	3	1		6	7	1	1	1		3	3	4	1	3		4					
	D	3			6	6	1	1			1	3	1	1	3		2					

China:																						
Hong Kong	C																					1
Tungliao	D		95																			
Dutch East Indies:																						
Balik-Papan	C					1																
	D					1																
Celebes—Makassar	C			9	2	6	2	1	1	1		1										
	D			6	2	5	2	1	1	1		1										
Java	D	432	779	829	1,017	754	197	214														
Batavia and West Java	C	68	130	132	154	128	46	37	27	27	31	15	24	33	19	18						
	D	68	129	132	152	128	44	37	27	27	31	15	24	33	19	18						
Cheribon	C				1																	
	D				1																	
East Java and Madura	C	18	17	10	8	7	5	2					1		1	1						
	D	18	17	10	8	7	5	2					1		1	1						
Pasoeroean Residency	C				P																	
Surabaya Residency	C				P												1					
	D																1					
Surakarta Residency	C			P	P																	
Ecuador: Guayaquil [1]																						
Egypt:																						
Alexandria	C	1			12	5			1		1											
	D				7	2			1		1											
Beni-Souef	C																				4	
	D																				1	
Cairo	C					2																
	D					2																
Maghagha District	C																			1		
	D																			1		
Minieh Province	C																			32	9	
	D																			5	4	
Suez	C	1				1	1		3		3	4	3	3		4	7	3		3	2	
	D					1	1		1		3	3	2	1		2	3	4		2	2	
Greece:																						
Athens and Piræus	C	3	1			3																
	D		1			1																
Mitylene	C	5	1	3	3																	
Patras	C	2	1	1																		
	D		1	1																		
Hawaii Territory: Hawaii	D										1											
India	C	2,710	3,246	3,600	5,518	7,097	2,544	2,699	3,601	3,808	5,188	5,776	6,136	6,074								
	D	1,428	1,792	2,065	3,269	4,925	1,653	1,661	2,577	2,630	3,585	3,999	4,828	4,586								
Bassein	D	14	8	4	4	17	3	3		2	1	2	4	5	5	5	7	5	4	5	1	
Bombay	C	7	4			3	5	4	2	3	5	14	7	7	4	16	23	21				
	D	5	3			3	2	2	3	2	6	14	7	6	4	11	25	21	15	14	19	
Calcutta	C	18				2																
	D	10						1											2			
Madras Presidency	C	465	583	470	791	560	107	132	79	184	142	112	64	53								
	D	230	298	282	359	206	63	64	60	69	79	72	34	27								
Rangoon	C	6	11	11	15	17	8	9	7	11	15	16	6	11	5	11	3	11				
	D	6	11	11	15	16	7	7	6	10	12	15	6	10	4	9	5	8	5	1	3	
Indo-China: [1] Saigon	C	2		1																		

[1] See monthly table below.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	April, 1928: 7	April, 1928: 14	April, 1928: 21	April, 1928: 28	May 4, 1928
Iraq:																						
Baghdad	C						1	1		2		1	1		2	2	1		1	4		
	D						1			1		1	1		2	2	1		1			
Dulaim Liwa	C								1													
Kwangchow-Wan[1]																						
Madagascar[1]																						
Mauritius[1]																						
Nigeria:[1] Lagos	C			17	13	10	2	3	3	2	2	3	2	1	2		2	3	2			
	D			17	13	8	3	3	3	2	2	3	2	1	2		2	3	1			
Peru[1]																						
Senegal:[2]																						
Baol	C	72	95	P	P																	
	D	33	40																			
Cayor	C	463	176	48																		
	D	233	88	28																		
Dakar	C	20	1																			
	D	12																				
Louga	C	5	8																			
	D	4																				
Rufisque	C	16																				
	D	12																				
Thies and vicinity	C	9	1	1													8					
	D	7															4					
Siam	C		13	1	3	16	5	3	6	6	13	4	11	14	7	8	13			11		
	D		9		2	11	1	1	5	5	10	4	10	12	6	9	10					
Bangkok	C		2			1		1	1		1						1			3	1	
	D			1		1		1	1		1						1			2		
Straits Settlements: Singapore	C			1						1	1	1		1		1						
	D			1						1	1	1				1						
Syria[1]																						
Tunisia[1]																						
Turkey: Constantinople	C	1	1		2																	
	D		1		1																	

Union of South Africa:																						
Cape Province	C			2	2		1															
	D			2	1		1															
Orange Free State	C			1	8			2		3	4	1			3	2						
	D			1	6			1		3	1				3	2						
Union of Soviet Socialist Republics:																						
Chita district	C		1																			
	D		1																			
Northern Caucasus	C	14	1																			
	D	10																				
Venezuela: State of Miranda—Tacata and Cua	C													P								
On vessel:																						
At La Plata, from Rosario, Argentina	C					1																
S.S. Aghios Gerasimos, at Vigo, Spain	C			3																		

[1] See monthly table below.
[2] During January, 1928, 5 cases of plague were reported in interior of Senegal; 17 cases with 13 deaths during last 2 weeks in February; 8 cases and 4 deaths, Mar. 11 to 20, 1928.
[3] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Algeria: Algiers [4]	C		2				
Angola	C		3				
British East Africa: Kenya	C	95	62	26	24		
Ecuador: Guayaquil	C	15	18	4	6	10	
	D		5	4	3	1	
Indo-China (French)	C	14	10	7		5	6
Kwangchow-Wan	C					18	3
Madagascar	C	314	692	427	342		
	D	286	605	388	317		
Ambositra Province	C	7	25	105	67		
	D	7	17	96	66		
Antsirabe Province	C	39	109	117	108		
	D	38	108	117	108		
Itasy Province	C	36	104	33	19		
	D	41	94	29	17		

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Madagascar—Continued.							
Moramanga Province	C	12	95	19	25		
	D	12	83	19	24		
Tananarive Province	C	211	408	155	123		
	D	189	354	129	102		
Mauritius	C	1					
Nigeria	C	32	63	16	16		
	D	29	61	16	16		
Peru	C	34	34		41		
	D	19	11		14		
Callao	D	3	3				
Lima	C		7				
	D		3				
Senegal	C			5	17	8	81
	D				13	4	40
Syria: Beirut	C		2				

[4] 1 case of plague at Algiers May 2, 1928.

PLAGUE RATS ON VESSELS

S. S. *Modemi* at Goteborg, Sweden, from Bahia and Buenos Aires via Cape Verde Islands, December 22, 1927.
S. S. *Gydavore* at Landskrona, Sweden, from Rosario via Canary Islands, January 22, 1928.
S. S. *Dryden* at Liverpool from La Plata River ports, January 29, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928 18	25	March, 1928 3	10	17	24	31	April, 1928 7	14	21	28	May 4, 1928
Algeria [1]	C	459	382	683	661	170	129	71	30		28	14	3				12			
Algiers	C					3	9	15	4		5	1		2	2	1		2		
Oran	C	9	16	11	20	39	29	11	1		2	2		2	10		3	1		
Angola:[1]																				
Arabia: Aden	C				1	3	1		1											
Brazil:[1]																				
Para	C	1																		
Rio de Janeiro	C	6	10		1								1							
	D	4	9		1								1							
British East Africa [1]																				
Kenya—Mombasa	C													1						
Tanganyiki	D	21	8	P	P	P	8	5												
British South Africa:																				
Northern Rhodesia	C	55	39	164	185	252	236	233	79	117	38	63		54	8					
	D	1	2	11	64	62	31	23	5	32	2	3		9						
Southern Rhodesia	C				3	2	1	3	2	4	P	3	4	1	2					
	D									1										
Canada:																				
Alberta	C	17	17	23	10	10	11	27		3		7	7	20	7	13	4	2	3	
Calgary	C	1											1							
Edmonton	C			1	1	8	5	3	1		11	1	1	11	1	7	2			
British Columbia: Vancouver	C		2			4	8	26	2	1	3	4	2	5	6	4	11			
Manitoba	C	13	9	7	19	7	11	1												
Winnipeg	C	5	4	2	2	2	2	2												
New Brunswick	C						1			1										
Nova Scotia	C		2	1																
Halifax	C		1	1																
Ontario	C	60	22	96	264	347	212	243	40	51	36	20	19	35	20	9	6	18	18	
Hamilton	C					2							2							
Kingston	C				1		1	1									2		1	
Ottawa	C	27	40	67	134	63	60	68	11	3	1	7	6	8	10	2		3	1	
Toronto	C		2	10	34	39	28	20	4	4	2	4	2	3	3	1	2	4	4	1
Windsor	C			9																

Quebec	C	1		8	25	16	44	26	11	23		18	22	40	35	15	20	25		38
Montreal	C				1		8	8	5	1	3		6	3				6	2	1
Quebec	C					4	5	5		2	5	4	3	4	4	5	4			9
Riviere du Loup	C				3															
Sherbrooke	C														3					
Saskatchewan	C	14	68	31	34	58	52	97	7	8		7	14	7		12	2	23	15	
Moose Jaw	C	10	16	3		1	4	11		2	6	5	2	5			3			
Regina	C	8		5	1	1									1	2	3	2		3
Saskatoon	C					2	4	15		2										
Ceylon: Colombo	C	1			1	2		4	2	1	3					1				
	D	1				1		1						1						
China:																				
Amoy	C											1	1	2	1					
Antung	C						1											1		
Canton	C		1									2	3	2		2	1			
	D		1																	
Chefoo	C		1	P		P							P							
	D		1								1									
Foochow	C	P	P	P	P	P	P	P		P		P								
Hong Kong	C	1	2				1	2	1	3		8	5	7	10	10	4	4	9	
	D	1	2				1	2		1	1	2		2	5	12	7	2	10	
Manchuria—																				
Changchun	C					1		4									2			
Dairen	C			1	2	1	5	15	3	4	6		1	3	5	6	7	3		
	D			1				8	4	2	1			3	5					
Fushun	C		1		1															
Harbin	C					2	1	5	2	1	3	1	2	3						
Mukden	C			2	1			4	18		3				1			3		
Pensihu	C			1																
Shanghai—																				
Foreigners only	C							5	1	1	1	3	1	1	3	2				
Including natives	D							11	5	4	4	6	2	1	3	3	3	1	3	
Tientsin	C		4	13	8	9	8	48	5	2	2	11	4	3	3	3				
Chosen [1]																				
Curacao (alastrim)	C							2	3											
Dominican Republic: Santo Domingo	C												2							
Dutch East Indies:																				
Borneo—																				
Pontianak	C									1										
Samarinda district	C				P															
South and East Borneo Residency	C	P																		
Java—																				
Batavia and West Java	C	4		4	25			4		1		1	4							
	D				15															
East Java and Madura	C	4	22	8	9	9	5	2			8	1								
	D			1								1								
Sumatra—Medan	C					8	9	23	7	3	1	3	6			1				
	D					2	3	11				2	4			1				

[1] See 10-day and monthly tables below.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928		March, 1928					April, 1928				May 4, 1928
									18	25	3	10	17	24	31	7	14	21	28	
Ecuador [1]																				
Egypt	C		3			4	4	1		1	1					52	11			
	D		1	1		1										33	6			
Cairo	C					2														
France.[1]																				
Gold Coast.[1]																				
Great Britain:																				
England and Wales	C	568	508	473	902	1,041	1,175	1,530	369	392	365	347	359	342	322	318	321	326	376	
Birmingham	C	1		1				44	1		2		1				1			
Bradford	C				11	19	32	24	7	1		4	9		5	5	3	2	7	
Bristol	C			6	4	8		3			1	3		2	8	2	1	10	1	
Cardiff	C				1		1								5				1	
Castleford	C									1	1	2	2	16	7	11	27	11	20	
Leeds	C	5	3	7	5	16	11	3	1	2	4	2	3	5	3	3	2	2	1	
Liverpool	C						1					1								
London	C							4	10	1	2	1	10	5	1	1	7	5	3	
Manchester	C			3	6	25	5	25	1	4	1	2	4	3	3	4	2	4	2	
Newcastle on Tyne	C	1	2	6	9	55	22	27	4	1	4	3	3	4		2			4	
Nottingham	C						13	27	6	1	3	1	5	1	6	1	4	4	6	
Sheffield	C	2	1	10	6	9	14	8	1	2	2	1				1		10	2	
Stoke on Trent	C	1					4	1	2	4	3	6	11			1	4	10	5	
Greece:[1] Saloniki	D	2																		
India	C	5,911	4,398	3,153	4,052	6,731	10,676	17,777	4,567	4,220	5,251	4,812								
	D	1,668	1,120	715	927	1,650	2,429	3,709	1,0[illegible]3	938	949	866								
Bassein	C	1						1												
	D	1																		
Bombay	C	33	12	10	4	9	14	61	29	23	46	51	49	58	62	49	56	57	54	
	D	19	8	2	3	2		24	15	13	23	22	24	33	36	27	32	34	27	
Calcutta	C	27	22	5	5	25	36	58	9	18	14	30	20	29	45	40	49	51	31	
	D	25		6	2	11	27	34	5	11	10	24	15	21	33	35	32	42	21	
Karachi	C											1	1							
	D											1								
Madras	C	6	7	8	7	11	21	74	15	33	21	31	30	27	45	81	49	36	69	
	D		2		2	3	6	8	3	3	3	10	5	3	6	15	16	8	7	

Negapatam	C	3	1				5	8	1		1	1					1		5	
	D	2	1				3	3									1		2	
Rangoon	C	14	9	17	6	14	136	275	68	82	132	95	96	82	92	50	62	45	37	
	D	3	2	3	1	4	31	64	22	24	26	32	28	17	34	23	24	17	12	
Vizagapatam	C		3				3	10		1		1			3			2		
	D		2					8												
India (French):																				
Karikal	C	3	1	2	P															
	D	3	1	2																
Pondicherry	C	39	37	38	42	41	65	47			6	3		6	5	7	12		15	
	D	31	37	38	42	41	50	47			6	3		6	5	7	12		15	
Indo-China:[1] Saigon	C	1	1			1	3			2		1								
Iraq:																				
Bagdad	C		1	7	5	25	23	19	2		3	2	3	1		1				
	D		1	4	4	14	12	11	1		1	2	3	1						
Basra	C	1	4	2	3	4	2	1	1		2	4	4	1						
	D	1	4	2	1	3	1						1	1						
Italy:																				
Leghorn	C										1		1							
Palermo	C														3	2	1	3		
Rome and vicinity	C		1					3												
Jamaica (outside Kingston) (alastrim)	C	6	9	9	7	3	2	5	1	3		6	3	2	1	7		1	2	
Kingston (alastrim)	C		3	2																
Japan:																				
Nagasaki	C	2																		
	D	1																		
Tokyo	C							4		1		3	1	3	1	10				
	D							1			1	1				1				
Tokyo Prefecture	C													17	5	2	1			
Latvia[1]																				
Mauretania	C								P	P										
Mexico:[1]																				
Acapulco	C		2		1															
	D		2		1															
Chihuahua	D						1													
Jalisco (State)	C										P	P	P	P	P	P	P	P	P	
Guadalajara	D					2					1					2	2	1	4	5
Manzanillo	D						1						1							
Mexico City and surrounding territory	C					4		2	2											
San Luis Potosi	D	1																		
Tampico	C									1										
Torreon	D	1		2																
Morocco[1]																				
Nigeria:[1] Southern Province	C										7			40	26					
Palestine: Jerusalem	C					1		1						28	1					
	D							1												
Persia[1]																				
Poland	C	2				1	6	3	1				1							
	D	1																		

[1] See 10-day and monthly tables below.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928: 18	25	March, 1928: 3	10	17	24	31	April, 1928: 7	14	21	28	May 5, 1928
Portugal:[1]																				
Lisbon	C		3	8	4	10	12	12	3	9	4	4		2	3					
	D					1						1								
Oporto	C		1																	
Senegal: Dakar	C									8		26	17					1		
	D												12							
Siam	C	51	27	6	1	9	23	35	1	7	1	3		2	14					
	D	10	15			1	2	4	1	1		1			4					
Bangkok	C		3		1	1	3													
	D		1				1													
Spain:[1]																				
Malaga	D				1	1														
Seville	C						1													
Valencia	C			1			2					1		1	1					
Straits Settlements: Singapore	C				1			1	1				1					1		
Switzerland	C						2													
Syria[1]																				
Tunisia: Tunis	C						4	3	2	4	2	6	1		1	2				
Union of South Africa:																				
Cape Province	C	P		P				P												
Natal	C							P	P			P	P							
Orange Free State	C	P			P	P	P	P												
Transvaal	C			P	7															
Upper Volta	C								2	3				2			P			
Union of Soviet Socialist Republics[1]																				
Venezuela:																				
Maracaibo	D		2	1				1				1								
On vessel:																				
S. S. Arendskerk at Singapore from Amoy, China	C														P					
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C														1					

[1] See 10-day and monthly tables below.

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927	December, 1927	January, 1928			February, 1928			March, 1928			April, 1928	
								1–10	11–20	21–31	1–10	11–20	21–29	1–10	11–20	21–31	1–10	11–20
Algeria	C	376	459	382	682													
Oran	C	14	10	16	11													
Indo-China (French)	C	19	3	21	25	38	34		40	18	50	31	90	57	71	69		
Syria:																		
Aleppo	C						1		1									
Beirut	C						2			15	11	26		12	7	4	3	5
	D															2	1	
Damascus	C		3	5	22	13	12	11	2						1			

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Angola	C	51	73	71	7	10		
	D		2					
Congo	C	5	77					
Cuanza-Norte	C	1						
Cuanza-Sul	C		2		7	10		
Loanda	C	1						
Zaire	C	3	4	1				
Brazil: Porto Alegre	C	11	4	1			1	
British East Africa: Zanzibar	C		2					
	D		1					
Chosen	C	21	2	2		4	21	
	D	6		1		2	8	
Ecuador: Guayaquil	C	4	1	1	4	2	9	24
	D							1
France	C	37	7	4	14	11	10	13
Gold Coast	C	7	4				1	
Greece	C	10	4		5	6	11	19
	D						2	2

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Latvia	C		2				1	
Mexico	D	221	132	157	157			
Morocco	C	180	81	140	401	55	47	30
Nigeria	C	820	223	93		275		
	D	173	51	30		39		
Persia	D			2		7		
Portugal	C					143	115	
	D					22	8	
Spain: Madrid	D			1				
U. S. S. R.:								
Railways, etc	C	26	7	11	15	18		
Other territories in Europe	C	366	220	471	565			
Transcaucasus, Siberia, and Central Asia	C	80	40	21	20			
Ukraine	C	27	11	20	17	6		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Week ended— January, 1928: 21	28	February, 1928: 4	11	18	25	March, 1928: 3	10	17	24	31	April, 1928: 7	14	21
Algeria:																					
Algeria	C								1					1	2	1	1	2	5	1	3
	D													1							2
Oran	C						4		2			2	1	6	1	1		2	1	1	6
Argentina [1]																					
Austria: Vienna	C									1											
Bulgaria: [1] Sofia	C			17	6	1	6	1								3		3	14		
	D				1																
Chile:																					
Antofagasta	D			1																	
Talcahuano	D		1														1				
Valparaiso	C		1		1	2	1							1							
	D	2	1		2																
China: [1]																					
Manchuria—																					
Dairen	C																			7	
Harbin	C	2			1																
Tientsin	C		2																		
Chosen [1]																					
Czechoslovakia [1]																					
Egypt	C	2		12	4	14	8	2	6		1		13	3	1		1	1		2	1
	D	3		5		8	4		2				5	3			1				
Cairo	C					3															
	D					3															
Port Said	C			1		1															
Greece [1]																					
Ireland (Irish Free State)	C									1										1	
Cork County	C					3	1														
Donegal County, Letterkenny	C			4																	
Japan [1]																					
Latvia [1]																					
Lithuania [1]																					

Mexico:																					
Guadalajara	D					1															
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	15	2	1		2	1		4	3	6	6				
	D				2	1	5							3	1		3				
Monterey	D																1				
Morocco [1]	C						342	257	214	370	210	141			175	172	167	219	190	186	167
Palestine	C	11	1	5	3	9	8		2	2	1	1	2	6	1	5			2	3	
Peru [1]																					
Poland	C	50	35	19	64	93	195	101	92	87	66	57	62	57	89	90	90	125	77		
	D	6	2	4	11	10	16	4	3	5	7	10	3	7	6	5	6	7	7		
Portugal: [1] Oporto	C	1			1						1										
Rumania	C	36	16	17	22	35	68			15	24		14	26	28	29					
	D	1		2			3			2	7			4	1	2					
Syria: [1] Aleppo	C		2				2														
Tunisia	C	14		3	1	1	6	4				1				13		5			2
Union of South Africa:																					
Cape Province	C	P	P	P	P	P	1	P	P	1	P	P	P				P				
Natal	C	P	P	P	P	2	3		P		1	P	P		2	P	P				
Orange Free State	C			P		P				P	P	P	P				P				
Transvaal	C	1		5	P	P											P				
Union of Soviet Socialist Republics [1]																					
Yugoslavia [1]																					
On vessel: S. S. Gaika at Durban, Natal—from Mauritius	C													1							

[1] See 10-day and monthly tables below.

Place		1927				November, 1927			December, 1927			January, 1928			February, 1928		
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Algeria	C	67	33	10	12												
	D	13			1												
Algiers	C	2	2	6	2												
Bulgaria	C	12	24	7	2						2	7	6		8	12	6
	D		1	2	1						1		1		1	2	2
Morocco	C	148	76	7	11	5	14	7	5	6	75						

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C, indicates cases; D, deaths; P, present]

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Argentina: Rosario	C			1				
	D				1	1		
China: Shanghai	D			1				
Chosen	C	90	16	26	38	183	400	
	D	8	1	2	3	19	44	
Chemulpo	C	3				1		
Gensan	C	2				1		
	D					1		
Seoul	C	5	2					
	D	1	1					
Czechoslovakia	C	12	1		6			23
Greece: Athens	C	3			1	2	2	
Japan	C	1		1				
Latvia	C	6					1	
Lithuania	C	69	9	18	27	86	137	
	D	14	1	1	1	10	12	

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Mexico	D	64	36	29	33			
Peru								
Arequipa	D	3	2		1	2		
La Oroya	C					P	P	P
Lima	C	8						
Turkey	C						17	
	D						1	
U. S. S. R.:								
Railways, etc.	C	77	23	33	46	41		
Transcaucasus, Siberia, and Central Asia	C	208	61	49	80	7		
Ukraine	C	295	151	198	282	533		
Other territories in Europe	C	1,839	521		1,403			
Yugoslavia	C	20	1	1		7	24	3
	D	5				3		

YELLOW FEVER

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
Belgian Congo:																				
Boma	C											3								
	D											2								
Matadi	C											6	12	11	1	5	8			1
	D											2	6	8	2	5	6			

Dahomey:																				
Grand Popo	C						1													
	D						1													
Porto Novo	C	1																		
	D	1																		
Gold Coast:[1]																				
Ashanti—Obuasi	C		1																	
	D		1																	
Ivory Coast	C	1									1									
	D	1									1									
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	38														
	D	3	9	21	31	28														
Dakar	C	1			12	14	2	1	4			1	1							
	D				7	10	2	1	4			1	1							
Togoland	C		1																	
	D		1																	

[1] See monthly table below.

Place		July	August	September	October
Gold Coast	C	15	2	6	[illegible]
	D	4	2	4	[illegible]

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

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SPECIAL ARTICLES

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST SURG GEN. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912.

They contain: (1) Current information of the prevalence and geographic distribution of preventable diseases in the United States in so far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other communicable diseases throughout the world. (2) Articles relating to the cause, prevention, or control of disease. (3) Other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

PUBLIC HEALTH REPORTS

VOL. 43 JUNE 1, 1928 NO. 22

CURRENT WORLD PREVALENCE OF COMMUNICABLE DISEASES [1]

United States, April 8–May 5, 1928

The mortality from all causes in large cities continued high during the four weeks ended May 5 as compared with the corresponding weeks of last year; the average death rate in 66 large cities (annual basis) in these weeks was 15 per 1,000 population in the current year, 13.7 a year ago, and 14.2 in 1925. The average rate in the current year is the same as that for the preceding four weeks, and no tendency for the mortality to decline was indicated. The death rate for the week ended May 5 was 15.5, the highest so far reported for the cities this year. While the normal seasonal decline is somewhat overdue and the April mortality was higher than in the recent years not affected by marked respiratory epidemics, the general death rate in these cities for the first 18 weeks of 1928 (14.4) was about average; it was slightly higher than that for the corresponding period of 1927 (13.8), but the same as the rate in 1925. A comparison with 1926 is not made, since the mortality rate for the corresponding period of that year was abnormally high because of a respiratory epidemic.

Influenza and pneumonia.—Reported cases of influenza increased during April, and in the week ended May 5 there were 4,185 cases reported by 31 States, as compared with 3,300 in the preceding week. This increase occurred chiefly in Indiana, Wisconsin, Minnesota, North Dakota, Missouri, Arkansas, Texas, and New Mexico. The mortality from influenza and pneumonia in 95 cities was slightly lower for the two weeks ended April 21, the latest available, than for the preceding two weeks, when a maximum rate of 250 per 100,000 was reported, as shown in the accompanying table. The decline occurred in the average death rate for cities reporting in each of the geographic divisions except the West North Central and Mountain States. The mortality from influenza and pneumonia in these cities in the current year has exceeded that in 1927 in all sections except the South Atlantic and Pacific divisions, and the excess has been most marked in the East and West South Central and East North Central States.

[1] From the Office of Statistical Investigations, U. S. Public Health Service.

Average death rates per 100,000 (annual basis) from influenza and pneumonia in cities in each geographic division from March 11 to April 21, 1928, compared with corresponding period of 1927

Geographic division	1928			1927		
	Mar. 11-24	Mar. 25-Apr. 7	Apr. 8-21	Mar. 13-26	Mar. 27-Apr. 9	Apr. 10-23
Total (95 cities)	245	250	232	205	185	175
New England	218	215	180	177	158	168
Middle Atlantic	275	284	269	236	215	208
East North Central	226	256	223	158	151	149
West North Central	145	143	198	125	125	143
South Atlantic	226	222	218	312	227	212
East South Central	374	418	285	284	265	223
West South Central	375	310	285	188	191	115
Mountain	292	168	198	188	233	165
Pacific	122	117	88	123	143	119

Meningococcus meningitis.—The total cases of meningococcus meningitis reported by 42 States in the four weeks ended May 5 numbered 538 as against 578 in the preceding four-week period and 249 in the corresponding period of 1927. While the number of new cases reported in most States has shown little change in recent weeks, a rather marked decline occurred in a number of the Western States where the incidence of the disease had been relatively high. In Colorado the number of reported cases dropped from 54 in the four weeks ended April 7 to 22 in the four weeks ended May 5; in Arizona the number dropped from 17 to 7; in Arkansas from 10 to 3; in Oklahoma from 15 to 8; in Texas from 8 to 3; in Utah from 16 to 9; and in Oregon from 14 to 6. On the other hand, the number of cases reported in New York State increased from 108 to 176.

Smallpox.—A gradual seasonal decline in the number of smallpox cases reported by 42 States was apparent in the returns for the four weeks ended May 5, the total number reported for the period being less than 3,900—a decline of approximately 900 from the preceding four-week period. The reported cases for these four weeks numbered about 1,000 more than for the corresponding period of each of the preceding two years. Some decline has occurred in nearly all the States; only Montana reported a definite increase, the number increasing from 52 in the four weeks ended April 7 to 99 in the four weeks ended May 5. In all the States in which an increased prevalence was noted in the four weeks ended April 7, a decrease was reported in the following four weeks, the decreases being especially marked in California, Colorado, New Mexico, Missouri, Indiana, and West Virginia. In Oklahoma, where smallpox has been prevalent in recent months, the number of reported cases dropped to 192 in the two weeks ended May 5, as against 340 in the preceding two weeks.

Scarlet fever.—A seasonal decline in the incidence of scarlet fever during April was evident from the reports for 41 States, which showed a total of 3,900 cases in the week ended May 5 as compared with about 4,900 in the week ended March 31. The number of cases reported by Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania in the four weeks ended May 5 indicated a definite decline as compared with the preceding four-week period in these States, and smaller decreases occurred in most of the remaining States. Montana and Wyoming reported a slight increase, but the number of cases was small.

Diphtheria.—The number of cases of diphtheria reported weekly by 42 States has declined steadily since early in February, and in the week ended May 5 there were 1,300 cases reported as compared with 1,450 in the week ended April 7 and with 1,833 in the week ended March 3. The disease is still somewhat more prevalent than it was in 1926, but only slightly more so than it was in 1927.

Measles.—The total number of cases of measles reported by 38 States showed little or no change during March and April; the weekly number of cases reported was approximately 18,000. In general, the incidence of the disease has been higher in the current year than it was last year in the New England, Middle and South Atlantic, and East South Central States, but it has been lower than it was a year ago in the North Central, Mountain, and Pacific States. Among the States showing a rather high incidence the following reported an increase in the two weeks ended May 5 as compared with the preceding two weeks: Arkansas, Florida, Georgia, Louisiana, Tennessee, Kansas, Missouri, Indiana, Pennsylvania, New Jersey, New York, and Rhode Island. On the other hand, a decrease in cases was reported by Alabama, Maryland, Massachusetts, Michigan, North Carolina, New Mexico, and Texas. Measles epidemics are local in character and may occur at almost any season, but a general decline in prevalence should take place in May, and the summer months may be expected to bring the incidence to a low level.

Typhoid fever.—The typhoid fever incidence continued lower in April than in the same month for either of the preceding two years. No State reported as many as 20 cases a week in March or April, and the weekly case rates for 101 cities (annual basis) varied from 4 to 6 per 100,000 population, which is lower than the rates for any of the preceding four years at this season. The incidence rates have been higher in the South Atlantic and South Central States than in the remainder of the country, but have been favorable in these geographical districts as compared with earlier years.

Poliomyelitis.—The number of cases of poliomyelitis continued to decline during April, and 81 cases were reported by 43 States in the

four weeks ended May 5 as compared with 107 in the preceding four-week period. Of the 81 cases reported, 23 were in California, and no more than 5 in any other State.

Foreign Countries [1]

The general prevalence for certain epidemic diseases in most foreign countries during February and March is summarized below.

Plague.—Eight plague cases were reported during the second half of March in Ben Gardane district in southern Tunis near the Tripoli frontier. Tunis had been free from plague since August, 1927, and these cases occurred a long distance from the scene of the outbreaks of 1926–27. Algeria and Greece were both free from plague in February and March.

Plague cases continued to occur at Suez in March; 30 cases were reported from the beginning of January up to April 7. Only three plague cases have been reported elsewhere in Egypt since the beginning of the year—one at Alexandria and two in Upper Egypt.

The outbreak at Aden increased during March, and 462 cases were reported in the three weeks ended April 7, as compared with 424 cases in the preceding three weeks. In the week ended April 14, there were 108 cases reported, indicating a slight decline in new cases. From the beginning of the outbreak to April 14, 1,300 cases and 943 deaths had been reported. During the whole of the epidemic in 1900, which hitherto had been the most severe, 708 cases and 576 deaths were reported.

Plague spread rapidly in India in the beginning of February, 1928. During the week ended February 4, 4,517 cases and 3,296 deaths were reported, as compared with 1,394 cases and 967 deaths during the corresponding week of the preceding year. The number of plague cases and deaths reported between the middle of December and the middle of February was practically the same, week for week, as that reported during the corresponding period of 1925–26, a year of moderately severe plague prevalence.

The accompanying table shows that, in comparison with 1926, the plague situation in February, 1928, was rather bad in the United Provinces, Hyderabad, and Burma, but very good in the Punjab and in Bihar. The severe outbreak at the city of Hyderabad began to decline early in February. In upper Burma the spread of plague appears to have come to a standstill except in the town of Mandalay.

[1] Data from the Monthly Epidemiological Report of the Health Section of the League of Nations' Secretariat, Apr. 15, 1928, supplemented by information published in the PUBLIC HEALTH REPORTS.

Deaths from plague in the Provinces of India during the first six weeks of 1926, 1927, and 1928

Provinces	1926		1927		1928	
	Jan. 3-23	Jan. 24-Feb. 13	Jan. 2-22	Jan. 23-Feb. 12	Jan. 1-21	Jan. 22-Feb. 11
Punjab, Delhi, and Punjab States	1,426	3,142	392	460	200	294
United Provinces	1,920	2,910	1,134	1,062	2,203	3,884
Bihar and Orissa	380	659	326	498	190	350
Central Provinces	344	478	413	495	366	569
Madras Presidency	259	275	210	153	197	224
Hyderabad	348	700	91	68	1,854	1,771
Mysore	329	365	151	84	58	64
Bombay Presidency	598	663	135	134	308	397
Burma	438	488	157	285	890	1,161
Other Indian States	162	242	63	61	21	63
Total	6,204	9,922	3,072	3,300	6,296	8,777

In the United Provinces the outlook is somewhat disquieting, the number of plague cases and deaths reported having trebled from the week ended January 28 (757 deaths) to the week ended February 18 (2,329 deaths). Such a rate of increase, at this time of the year, has not been seen in the United Provinces since 1918; the nearest approach was in 1924, when the number of deaths attributed to plague doubled during the corresponding three weeks.

Plague is slightly more prevalent in Java than it was in 1926, but less so than in 1924 and 1925. During the 12 weeks ended January 28, 1928, there were 2,604 deaths attributed to plague, as compared with 2,175 during the corresponding period of the preceding year. Central Java continues to be most heavily infected, but western Java has not escaped.

The actual incidence of plague in the east African centers of plague in Kenya, Uganda, and Madagascar is about the same as it was early in 1927. In Madagascar, 705 deaths were ascribed to plague during the first two months of 1928, as compared with 749 during the corresponding period of the preceding year. No plague case has been reported either in Mauritius or in Réunion since early in 1927.

In the Union of South Africa, 17 plague cases were reported on inland farms from the beginning of the year to March 24.

The plague season has not yet begun in the west African centers, but there have been a few cases at Lagos and Ijebu in Nigeria (37 cases up to March 10), and in Senegal (25 up to March 20).

Cholera.—The incidence of cholera was above normal at Calcutta in March, the disease having been very prevalent in Bengal during the winter. There was no cholera in ports west of Bombay.

Cholera in India, though slightly less prevalent in February than in January, caused about the same number of deaths as in the corresponding month of the two preceding years, but more than during the corresponding periods of 1922–25. During the three weeks ended February 18, 1928, 4,802 deaths were attributed to cholera, as compared with 4,331 deaths in 1927. The disease was almost entirely confined to the two most persistent centers—(1) Bengal, with Assam and Orissa, and (2) Madras Presidency.

Cholera cases and deaths in maritime towns of the Far East in March, 1926, 1927, and 1928, reported to the Singapore Bureau

Port	1926		1927		1928	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Bombay	0	0	0	0		2
Tuticorin	0	0	0	0		1
Negapatam		2		1	0	0
Madras		30		8		9
Calcutta		193		195		380
Bassein	0	0		4		5
Rangoon		4		12		11
Mulmein	0	0	0	0		4
Singapore	0	0	0	0	1	1
Bangkok	319	213	69	46	40	23
Saigon	3	2	2	2	52	33
Turane	6	0	0	0	1	1
Manila	2	0	0	0	0	0
Canton			0	0	1	1

In Siam, 395 cases were reported during the first eight weeks of 1928, as compared with 326 and 1,168 cases during the corresponding periods of 1927 and 1926, respectively. During the first eight weeks of each of the years from 1922 to 1925 only from 2 to 13 cholera cases were reported weekly in the whole country.

During the first quarter of 1928, cholera was prevalent in the southern part of French Indo-China, 220 cases being reported in Cambodia, 1,162 cases in Cochin-China, and 376 in Annam up to March 20. Tonkin and Laos were reported free from cholera.

Yellow fever.—In the Belgian Congo, there was one yellow fever case at Matadi on February 24 and one case on board a ship at Boma on March 5. No other case was reported there or elsewhere in Africa in March.

Smallpox.—Cases of smallpox were rare in most countries on the European continent early in 1928. No case was reported in Bulgaria, Czechoslovakia, Denmark, Gibraltar, Hungary, Lithuania, Luxemburg, and Rumania either in January or February; in Sweden up to March 15; in the Kingdom of the Serbs, Croats, and Slovenes up to March 21; nor in the Irish Free State, Northern Ireland, Scotland, and Switzerland up to March 24. Malta and Norway were both free from smallpox in January. Estonia, Finland, and Latvia each had reported one case in the first two months of the year; Belgium

reported one case up to March 24, and Germany one case up to March 10. Poland reported three cases up to March 10, and Italy three cases in the first two weeks of the year.

Greece, with eight cases of smallpox reported up to the end of February, and France, with 21 cases in the same period, showed marked improvement over the corresponding months of 1927, when they reported, respectively, 36 and 108 cases.

Portugal reported 258 smallpox cases with 30 deaths in the first two months. No information was available for Spain or for the Union of Soviet Socialist Republics.

In England and Wales smallpox was less prevalent in the first 12 weeks of the year than in the corresponding period of 1927; 4,377 cases were reported as compared with 5,774 in 1927.

Marked improvement in the smallpox situation in northern Africa is indicated by the early reports for 1928. In Algeria 174 cases had been reported up to March 24 as against 518 cases in the period of 1927; in Egypt only 2 cases up to February 11 as against 121; and in French Morocco 97 cases up to February 29 as compared with 265. In Tunis a slight increase occurred, and 39 cases were reported up to March 18 as compared with 26 in the corresponding period of 1927.

The severe form of smallpox persisted in northern Rhodesia in 1928; 388 cases and 46 deaths were reported up to February 4, and 297 cases and 42 deaths in the next five weeks.

There was an increase of smallpox cases in India after the middle of January, 18,336 cases being reported during the four weeks ended February 18 as compared with 12,668 cases in the preceding four weeks. The incidence was not quite as high, however, as in the preceding year, when 23,282 cases were reported during the four weeks ended February 19.

Typhus fever.—The serious outbreak of typhus fever which began last year in Morocco persisted unabated in the early months of 1928. Up to March 24, 2,464 cases were reported as compared with 484 during the corresponding period of the preceding year. The principal center of the disease is in the southern part of the country, especially at Marrakesh and in the Sous area, the principal town of which, Taroudant, has suffered most severely. During the period under review, 940 cases were reported in the town of Taroudant, which has about 8,000 inhabitants. There were 527 cases at Marrakesh and 218 at Casablanca. Unfavorable economic conditions resulting from the poor harvests of 1926 and 1927 in the part of the country south of the great Atlas Mountain Range has undoubtedly predisposed the population to the epidemic which is here of a severe type. It is said that typhus elsewhere in Morocco is usually of a relatively mild type.

In eastern Europe the typhus situation was satisfactory in the early part of 1928. In Poland 738 cases were notified up to March 10, as compared with 825 during the corresponding period of 1927. In Lithuania an increase occurred, and 223 cases were reported in January and February as compared with 46 cases in the first two months of last year. No reports were available for 1928 for the Union of Soviet Socialist Republics, but fewer cases were reported for the fourth quarter of 1927 than in the preceding years.

Influenza.—Influenza was little in evidence in Europe during the first quarter of 1928. Although minor outbreaks may occur in April or May, there is every indication that 1928 will be a year with low influenza incidence, comparable with 1921 or 1926.

In large towns of England and Wales the number of deaths attributed to influenza decreased in January, and then remained more or less stationary up to the middle of March; 270 deaths were reported during the two weeks ended March 31, as compared with 209 deaths during the preceding two weeks. During the first quarter of 1928, 1,467 deaths were ascribed to influenza, as against 7,477 during the first quarter of 1927. There was no increase of the general death rate during the period under review.

Mortality statistics of large German towns showed no evidence of influenza outbreaks up to March 10. During the first 10 weeks of 1928 there were 481 deaths ascribed to influenza; in the corresponding weeks of 1927 the number was 3,256.

Returns of influenza cases reported in Denmark, Norway, Sweden, and Finland showed a low prevalence of this disease in January and February. Very few deaths from influenza were reported in Polish towns during these months; at Warsaw, there were 7 deaths from this cause during the four weeks ended March 24. In Vienna 4 deaths were attributed to influenza in January and 16 deaths in Budapest during the four weeks ended March 24.

In Switzerland, only 65 deaths were ascribed to influenza in January, as compared with 1,648 during the corresponding month of 1927. In the Netherlands, 147 deaths were attributed to influenza in January, as against 2,015 in the corresponding month last year.

In Paris, there were 74 deaths from influenza in January, 62 in February, and 26 during the first 20 days of March; statistics for other French towns showed but little prevalence of the disease. There were very few deaths from influenza in Italian towns in January and February.

CURRENT STATE MORTALITY STATISTICS

For the information of public health officials and others interested, the data in the following tables have been taken from the monthly mortality reports of State health departments for the latest month for which published records are available. Statistics of most communicable diseases are not included, since they are available in other tabulations in the Public Health Reports. Statistics of deaths from other causes are limited for the most part to those causes which appear in the State reports. In the case of States which publish detailed mortality reports each month, the record of only the principal groups of causes and certain important specific causes have been used.

For purposes of comparison, the mortality records for the corresponding month in a few preceding years have been compiled. The rates have been computed upon the populations as estimated for July 1 of each year represented.

These tabulations will be enlarged as the current data on mortality from additional States become available.

Summaries of annual mortality statistics for the year 1927 are appended whenever the data are available from the States, and comparisons with several prior years are included when practicable.

Monthly Mortality Statistics

ALABAMA

Death classification by cause or age	February					
	White			Colored		
	1928	1927	1926	1928	1927	1926
Annual rate per 1,000: All causes	10.1	7.8	10.8	17.3	12.5	18.3
Rate per 1,000 live births: Infant mortality	78.4	44.1	73.0	118.0	75.5	106.1
Annual rate per 100,000:						
Influenza	83.9	30.7	141.6	112.8	35.0	165.9
Tuberculosis, all forms	53.9	46.8	60.6	179.1	136.9	163.0
Cancer, all forms	36.0	47.6	46.6	39.5	45.2	37.8
Diabetes mellitus	6.0	8.1	7.4	14.1	5.8	11.6
Cerebral hemorrhage, apoplexy	47.2	29.9	40.1	84.6	40.8	77.1
Diseases of the heart	116.9	94.4	105.6	150.9	119.4	142.6
Pneumonia, all forms	144.6	72.6	144.8	200.2	106.3	267.8
Diarrhea enteritis (under 2 years)	6.0	4.8	10.6	9.9	7.3	2.9
Chronic nephritis	66.7	58.9	76.1	90.2	83.0	103.3
Puerperal state	21.0	12.1	15.5	16.9	32.0	32.0
Congenital malformation and other diseases of early infancy	70.4	57.3	75.3	98.7	58.3	85.9
Automobile accidents	14.2	17.8	10.6	7.0	8.7	7.3
Number of deaths:						
Under 1 year	233	142	206	201	130	173
1 to 4 years	90	56	84	61	27	68
5 to 14 years	46	45	47	44	36	36
15 to 44 years	232	227	262	386	292	306
45 to 64 years	242	177	255	304	206	306
65 years and over	489	319	454	223	155	268
Age not stated	11	4	6	9	9	8

Monthly mortality statistics—Continued

CONNECTICUT

Death classification by cause or age	February					
	1928	1927	1926	1925	1924	1923
Annual rate per 1,000: All causes	12.0	11.5	12.7	12.7	13.2	16.1
Rate per 1,000 live births: Infant mortality	55.7	65.2	75.7	71.9	83.9	81.6
Annual rate per 100,000:						
Influenza	25.8	24.7	31.8	52.0	42.7	130.8
Tuberculosis, all forms	75.1	78.9	86.1	81.0	91.3	99.0
Cancer	106.6	97.8	107.9	92.9	101.4	82.2
Diseases of the heart	200.3	207.9	204.9	167.0	203.6	(1)
Pneumonia, all forms	148.6	119.1	132.1	157.7	176.8	307.5
Diarrhea and enteritis (under 2 years)	4.8	9.0	12.5	12.8	9.2	10.6
Puerperal diseases	8.9	12.3	10.0	8.5	11.7	14.1
Number of deaths:						
Under 1 year	133	155	185	188	216	206
1 to 4 years	61	54	81	66	83	111
5 to 64 years	607	677	717	714	720	794
65 years and over	685	514	530	520	571	712

[1] Not available.

IOWA AND NORTH CAROLINA

MARCH, 1928

Death classification by cause or age	Iowa	North Carolina
Annual rate per 1,000: 1-205. All causes	12.1	(1)
Rate per 1,000 live births: Infant mortality	66.4	(1)
Annual rate per 100,000:		
11. Influenza	79.5	63.7
31- 37. Tuberculosis, all forms	88.8	86.6
43- 49. Cancer and other malignant tumors	121.2	
57. Diabetes mellitus	19.9	
70- 86. Diseases of the nervous system and of the organs of special sense	153.2	
74. Cerebral hemorrhage, apoplexy	111.5	
87- 96. Diseases of the circulatory system	310.8	
87- 90. Diseases of the heart	279.8	
97-107. Diseases of the respiratory system	105.2	
100-101. Pneumonia (broncho and lobar)	98.4	168.7
108-127. Diseases of the digestive system	65.5	
113. Diarrhea & enteritis (under 2 years)	5.8	10.0
128-142. Nonvenereal diseases of the genito-urinary system	64.5	
128, 129. Nephritis, all forms	53.8	
143-150. The puerperal state	11.2	
151-158. Diseases of the skin and of the bones and organs of locomotion	2.9	
159-163. Malformation and diseases of early infancy	61.1	
165-203. External causes	83.9	
165-174. Suicides (total)		6.0
188c. Automobile accidents	12.1	8.8
197-200. Homicides		8.0
Number of deaths:		
Under 1 year	236	
1 to 4 years	66	
5 to 64 years	927	
65 years and over	1,265	

[1] Not available.

Monthly mortality statistics—Continued

INDIANA

Death classification by cause or age	February					
	1928	1927	1926	1925	1924	1923
Annual rate per 1,000: All causes	11.7	12.3	13.2	13.5	12.5	17.1
Rate per 1,000 live births: Infant mortality	59.8	67.1	74.2	77.1	75.6	91.7
Annual rate per 100,000:						
Influenza	44.0	46.3	62.6	77.5	47.2	220.2
Tuberculosis, all forms	67.4	79.0	88.9	86.8	80.0	120.9
Cancer	87.6	103.0	100.1	98.6	84.6	108.4
Apoplexy	122.5	107.6	121.0	109.5	(1)	(1)
Organic heart disease	158.1	169.7	177.3	155.8	(1)	(1)
Pneumonia, lobar and broncho	120.1	111.3	141.5	181.1	144.9	295.9
Diarrhea and enteritis (under 2 years)	10.7	7.4	7.1	9.3	9.9	[2] 12.9
Bright's disease	86.8	84.8	83.0	86.3	(1)	(1)
Puerperal causes	8.7	14.9	15.4	15.6	[2] 7.0	[2] 6.5
Number of deaths:						
Under 1 year	278	319	355	385	306	484
1 to 4 years	109	121	150	93	124	213
5 to 14 years	63	69	63	85	81	129
15 to 64 years	1,173	1,202	1,179	1,309	1,206	1,560
65 years and over	1,340	1,256	1,422	1,334	1,242	1,619

[1] Not available. [2] Puerperal septicemia.

KANSAS AND OKLAHOMA

JANUARY, 1928

Death classification by cause or age	Kansas	Oklahoma
Annual rate per 1,000: 1-205. All causes	10.9	10.5
Rate per 1,000 live births: Infant mortality	70.0	86.2
Annual rate per 100,000:		
11. Influenza	53.3	21.8
31- 37. Tuberculosis, all forms	29.5	59.7
43- 49. Cancer and other malignant tumors	95.6	58.7
57. Diabetes mellitus	24.4	12.6
70- 86. Diseases of nervous system and of the organs of special sense	146.9	114.5
74. Cerebral hemorrhage, apoplexy	114.2	63.6
87- 96. Diseases of circulatory system	213.7	90.8
87- 90. Diseases of the heart	181.6	82.0
97-107. Diseases of respiratory system	126.4	209.7
100, 101. Pneumonia, all forms	105.9	198.0
108-127. Diseases of digestive system	62.9	62.1
113. Diarrhea and enteritis (under 2 years)	7.7	11.2
128-142. Nonvenereal diseases of the genito-urinary system	96.9	67.5
128, 129. Nephritis, all forms	85.3	64.1
143-150. The puerperal state	7.1	11.6
151-158. Diseases of the skin and bones and of the organs of locomotion	8.3	----------
159-163. Malformations and diseases of early infancy	53.9	80.9
165-203. External causes	80.8	72.8
188c. Automobile accidents	10.9	8.7
Number of deaths:		
Under 1 year	151	391
1 to 4 years	60	84
5 to 14 years	52	----------
15 to 44 years	241	----------
45 to 69 years	527	----------
70 years and over	605	----------
5 to 64 years	----------	908
65 years and over	----------	779

Monthly mortality statistics—Continued

NEW JERSEY

JANUARY

Death classification by cause or age	1928	1927	1926	1925	1924	1923
Annual rate per 1,000: All causes	11.3	12.1	13.0	13.1	11.6	11.4
Annual rate per 100,000:						
Influenza	12.6	21.4	20.8	23.2	10.4	34.0
Tuberculosis, all forms	65.0	74.4	81.9	75.2	75.6	83.1
Cancer	99.2	94.5	98.9	103.0	84.6	86.6
Diseases of the nervous system	112.5	133.8	145.9	150.4	135.4	138.8
Diseases of the circulatory system	272.7	258.8	272.3	256.1	211.3	265.9
Diseases of the respiratory system (pneumonia and tuberculosis excepted)	59.8	75.1	102.1	101.1	90.9	113.4
Pneumonia	80.4	97.7	128.9	122.3	92.9	139.8
Diseases of the digestive system [1]	47.5	63.4	51.2	46.8	45.1	47.1
Infantile diarrhea	9.6	14.8	13.8	16.7	16.7	17.9
Bright's disease	108.5	104.9	101.4	117.7	117.0	129.5
Automobile accidents	12.9	14.1	(2)	(2)	(2)	(2)
Number of deaths:						
Under 1 year	417	466	431	514	501	516
1-4 years	134	119	196	181	180	279
5-59 years	1,548	1,668	1,639	1,639	1,405	1,570
60 years and over	1,576	1,601	1,794	1,656	1,395	1,632

FEBRUARY

Death classification by cause or age	1928	1927	1926	1925	1924	1923
Annual rate per 1,000: All causes	12.4	12.5	14.9	12.6	13.1	18.3
Annual rate per 100,000:						
Influenza	16.1	20.9	17.4	20.6	15.0	95.1
Tuberculosis, all forms	70.8	76.5	96.4	82.9	81.8	100.8
Cancer	102.4	108.1	105.2	95.2	105.8	96.2
Diseases of the nervous system	120.9	136.3	160.1	139.8	148.3	177.3
Diseases of the circulatory system	272.4	268.1	299.7	240.1	265.2	345.0
Diseases of the respiratory system (pneumonia and tuberculosis excepted)	71.8	71.6	120.1	84.4	100.1	176.9
Pneumonia	108.7	84.5	133.5	112.3	99.7	205.4
Diseases of the digestive system [1]	58.0	72.3	59.5	63.7	57.5	69.6
Infantile diarrhea	10.5	17.0	18.8	19.2	15.0	28.1
Bright's disease	118.6	107.8	133.2	105.7	114.0	144.9
Automobile accidents	17.1	21.2	13.1	(2)	(2)	(2)
Number of deaths:						
Under 1 year	471	413	478	447	455	569
1 to 4 years	158	140	254	139	193	339
5 to 59 years	1,574	1,577	1,739	1,467	1,548	1,975
60 years and over	1,568	1,479	1,723	1,425	1,481	1,935

[1] Infantile diarrhea excepted. [2] Not available.

PENNSYLVANIA

Death classification by cause	January				
	1928	1927	1926	1925	1924
Annual rate per 1,000: 1-205. All causes	12.4	13.6	14.2	13.8	14.0
Rate per 1,000 live births: Infant mortality	70.6	93.0	79.9	87.0	(4)
Annual rate per 100,000: [1]					
11. Influenza	37.3	50.7	52.3	43.0	36.5
31-37. Tuberculosis, all forms	64.7	67.1	83.1	78.5	87.7
43-49. Cancer	95.5	91.0	99.8	90.0	87.5
57. Diabetes	21.7	22.4	19.0	23.2	16.5
74. Apoplexy	100.0	99.8	(4)	93.4	(4)
87-90. Heart diseases	246.0	254.0	234.0	188.0	(4)
100-101. Pneumonia, all forms	131.0	177.0	205.0	204.0	214.8
113. Enteritis (under 2 years.)	16.7	19.1	20.6	21.8	22.9
128, 129. Nephritis, all forms	117.0	127.0	122.0	123.0	123.6
143-150. The puerperal state [2]	5.3	6.5	7.0	6.7	(4)
159-163. Congenital malformation and diseases of early infancy [3]	34.9	40.3	40.3	42.4	(4)
188c. Automobile accidents	13.5	13.9	11.4	7.3	13.1

[1] Except the puerperal state and diseases of early infancy.
[2] Rate per 1,000 total births.
[3] Rate per 1,000 live births.
[4] Not available.

Monthly mortality statistics—Continued

SOUTH CAROLINA

JANUARY, FEBRUARY, MARCH

Death classification by cause	January		February		March	
	1928	1927	1928	1927	1928	1927
Annual rate per 100,000:						
Influenza	49.9	22.3	81.7	27.6	132.6	28.7
Tuberculosis, all forms	72.6	76.6	74.9	62.2	87.2	102.1
Cancer and malignant tumors	30.3	30.6	39.2	40.3	51.2	36.4
Diabetes	12.6	5.7	13.5	9.9	11.4	11.5
Diseases of the circulatory system	220.5	241.9	278.2	272.7	277.9	277.0
Pneumonia, all forms	178.1	132.1	155.3	199.2	161.7	88.1
Intestinal diseases	18.9	30.0	23.6	20.5	30.3	27.4
Intestinal diseases of children under 1 year	3.8	7.7	8.8	8.5	8.2	10.8
Kidney diseases	83.4	73.4	99.9	80.5	108.6	93.2
Parturition and pregnancy	12.6	13.4	24.3	18.4	25.3	13.4
Premature births	37.3	42.8	58.7	43.8	37.3	45.9
Suicide	3.8	3.8	4.1	4.2	1.9	3.2
Homicide	8.8	7.7	9.5	7.8	5.7	12.8
Automobile accidents	11.4	10.2	10.8	8.5	11.4	9.6
Number of deaths under 1 year	305	292	305	257	385	329

TENNESSEE

JANUARY, FEBRUARY, MARCH

Death classification by cause	January		February		March	
	1928	1927	1928	1927	1928	1927
Annual rate per 1,000: 1–205. All causes	11.8	10.8	12.9	11.4	12.3	11.9
Annual rate per 100,000:						
11. Influenza	77.2	40.3	89.5	45.6	88.5	68.2
31–37. Tuberculosis, all forms	121.9	115.1	150.9	145.8	140.7	138.8
43–49. Cancer	58.8	53.1	51.3	55.6	53.2	63.5
87–90. Heart disease	105.9	(1)	137.3	(1)	101.9	(1)
100–101. Pneumonia, all forms	163.8	120.8	163.0	124.9	162.8	129.8
113. Diarrhea and enteritis (under 2 years)	4.7	4.7	3.5	4.7	4.7	6.6
140. Puerperal septicemia	6.1	5.2	4.5	8.4	7.1	7.6
188c. Automobile accidents	13.2	9.0	10.6	7.9	9.4	7.1

[1] Not available.

Annual Mortality Statistics, 1927

Mortality statistics for 1927 have been received from Minnesota, and are given below.

Mortality in Minnesota in 1927, compared with previous years

Death classification by cause	1927	1926	1925	1924	1923	1922	1921	1920
Rate per 1,000: All causes	9.2	9.7	9.7	9.5	10.0	9.5	9.3	10.7
Rate per 1,000 live birth: Infant mortality	51.8	57.3	60.0	56.1	61.1	57.4	58.0	66.4
Rate per 100,000:								
Typhoid fever	1.0	1.0	1.8	1.4	2.4	2.2	3.7	3.0
Smallpox	0	0	7.6	11.9	.1	.3	1.0	.6
Measles	2.2	6.7	.6	5.4	11.2	1.5	1.3	6.6
Scarlet fever	3.4	5.8	5.0	8.1	9.3	7.3	7.8	4.9
Whooping cough	2.8	6.6	3.7	5.2	6.1	3.1	6.3	12.4
Diphtheria	3.1	5.8	8.9	8.5	8.4	7.7	9.0	10.1
Influenza	17.9	20.2	22.9	8.6	24.1	16.4	5.8	91.6
Acute anterior poliomyelitis	1.3	.6	5.5	1.2	.6	.8	4.2	.7
Meningococcus meningitis	2.2	.6	.7	.5	.8	.8	1.3	1.2
Tuberculosis, all forms	58.3	63.6	61.0	66.4	73.5	69.5	76.7	89.8
Cancer	101.9	99.7	104.3	99.5	98.8	94.9	89.5	95.1
Pneumonia	63.1	70.2	70.7	69.4	76.1	67.7	64.8	62.7
Diarrheal diseases of children	7.2	9.3	16.4	11.6	15.6	14.6	20.5	23.2
Puerperal septicemia [1]	3.1	3.6	3.9	4.0	5.2	3.6	5.8	6.1
Suicides	11.4	13.4	14.0	11.2	10.5	12.7	12.7	11.0
Accidents	60.9	60.6	63.0	62.6	67.7	61.2	62.9	62.7
Homicides	2.1	2.0	3.6	3.0	3.1	3.7	4.1	3.0

[1] Rate per 1,000 living births.

LOOSELY BOUND SULPHUR IN PITUITARY EXTRACTS

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INTRODUCTION

The rôle which sulphur, especially organically combined sulphur, plays in the economy of the animal body, and that of man in particular, has been greatly emphasized by the work of Hopkins (1921) and that of Abel and Geiling (1926). Thus, Hopkins succeeded in isolating glutathione, a peptide of cysteine and glutamic acid, from mammalian muscle and liver as well as from yeast, and concluded that this sulphur-containing peptide is the most important autoxidizable constituent of the cells. Abel and Geiling (1926) gave a fresh impetus to the study of sulphur when they demonstrated the high degree of lability of the sulphur in insulin and the relation of the loosely bound sulphur to the potency of insulin in lowering blood sugar.

Abel and Geiling found that the sulphur in insulin is liberated by short boiling with 0.1 N sodium carbonate, and that the amount of the "sodium carbonate sulphur" is directly proportional to the degree of hypoglycemic activity.

In later work with crystalline insulin du Vigneaud (1927) found that when it is split by acid hydrolysis cystine is found in the hydrolysate, as evidenced by the positive reaction with the Sullivan (1926) cystine test, which has been found highly specific for cystine or substances structurally like cystine. Du Vigneaud considers that insulin is most likely a derivative of cystine or of a compound like cystine.

Since insulin is the material elaborated by an endocrine gland, the islands of Langerhans, it became of interest to us to determine whether the active principle of other endocrine glands, as, for instance, the pituitary, contained cystine or cystinelike compounds, since, chemically speaking, little is known regarding the chemical nature of the active material of the pituitary gland.

The chemical study of the pituitary active principle is hampered by its instability and by the difficulty of getting a sufficient supply of material.

The pituitary body is divisible morphologically into two parts—anterior and posterior. From the posterior lobe extracts have been obtained which are endowed with various physiological activities such as stimulation of uterine contraction (oxytocic activity), augmentation of the blood pressure (pressor activity), and action on the kidney (renal activity).

The question as to whether the various activities of the posterior pituitary are due to one and the same active principle has long been

a moot one. Abel and Rouiller (1922) concluded that there is but one active principle, which, in its uninjured state, is not only a blood-pressure raising, but also is a plain-muscle-stimulating substance. This view has been consistently maintained by Abel and his associates, and evidence in favor of it is well reviewed by Abel (1924). Smith and McClosky (1924) likewise give evidence favoring a single active principle. On the other hand, other investigators, among whom may be mentioned Fühner in Germany (1913) and, especially, Dudley in England (1923), offer evidence suggesting the presence of more than one active principle.

Recently Kamm, Aldrich, Grote, Rowe, and Bugbee (1928) have apparently succeeded in separating two active principles from the posterior lobe of the pituitary gland, one of which raises blood pressure and another which stimulates contraction of the uterine muscle.

PHYSIOLOGICAL AND CHEMICAL TESTS OF EXTRACTS

The criterion of activity mainly relied on by us was the ability of the extract to raise the blood pressure when injected intravenously into an anesthetized dog.

The material which we have used in this work consisted of 21 samples of posterior pituitary and 12 samples of anterior pituitary. The pituitary preparations comprised the following.

1. Five samples of standard powdered pituitary (K_2, I_2, J_2, M_2, N_2) which had been prepared by Smith and McClosky (1924) in the course of their work on the standardization of pituitary extracts.
2. A fresh gland extract (D), 1 cubic centimeter of which represented the physiological activity of 7 milligrams of standard powdered pituitary.
3. A sample of a commercial powdered posterior pituitary (L) which, when assayed in this laboratory, was found to be of standard potency.
4. Two commercial samples—one labeled hypophysis cerebri (M), the other labeled desicated posterior pituitary (E). Both of these samples were physiologically inert.
5. A commercial sample of "pituitary body desiccated" (A), having a slight and almost negligible oxytocic activity.
6. Eleven commercial samples of posterior pituitary presumably made to conform to the U. S. P. X requirements. This material was kindly furnished by W. T. McClosky of the pharmacological laboratory of the Bureau of Food, Drug, and Insecticide Administration.
7. Twelve commercial samples of desiccated anterior pituitary furnished through the same source.

Extracts from these samples were made according to the U. S. P. X method of preparing extracts from standard pituitary. The pituitary powder was ground in an agate mortar with 10 cubic centimeter of 0.25 per cent acetic acid. The mixture was collected in pyrex test tubes and carefully brought to gentle boiling and filtered. The clear filtrates were then used for chemical and physiological

tests. In most cases 1 cubic centimeter of the extract represented 10 milligrams of pituitary powder. In some cases of potent extracts 1 cubic centimeter of solution represented only 5 milligrams of posterior pituitary powder, while with slightly potent powders and with the anterior, extracts were often used in which 1 cubic centimeter represented 20 milligrams of powder.

The pressor physiological activity, where indicated, was determined by the procedure described by Smith and McClosky (1924). Some observations have been made on the oxytocic power of the extracts by W. T. McClosky, to whom we are indebted. His findings have, in general, agreed with the pressor tests. The oxytocic study, however, will be reserved for a future publication in which the two physiological activities as measured by the pressor and oxytocic methods will be correlated quantitatively with the chemical reaction about to be described. For the present, as stated previously, the criterion of activity used by us is the power to raise the blood pressure when injected intravenously into a dog.

In the chemical work with the extracts a preliminary investigation was made to see whether any cystine or cystine complex was present in the standard extract. The unhydrolyzed extract gave a negative reaction for cysteine and cystine as determined by the Sullivan method. On hydrolysis for four hours with 20 per cent hydrochloric acid and bringing the hydrolysate to 0.1 N hydrochloric acid, a positive reaction for cystine or cystinelike compounds was obtained. While the hydrolysis was progressing, some tests were made on small amounts of the active extract for so-called loosely bound sulphur—that is, the formation of lead sulphide when heated with lead acetate and sodium hydroxide, along lines first laid down by Fleitmann (1848) in this work on the sulphur of proteins. This test proved to be decidedly positive; and since it required very little active extract and could be done speedily, attention was given to it, temporarily, rather than to the more time-taking cystine test. From application of the loosely bound sulphur test to the various extracts, an interesting relationship was indicated between the presence of highly reactive sulphur and physiological activity.

The expression "loosely bound sulphur" needs some explanation. It is a relative term and merely means that the sulphur is in a labile state and is more or less easily split off. The more dilute the alkali, the lower the temperature, and the shorter the time needed to split off the sulphur in the compound, the more labile is the sulphur. Compounds differ greatly in this respect. Cystine complexes, as, for instance, cystine in peptide arrangement, have a much more reactive sulphur than uncombined cystine, as first noted by Fischer

and Gerngross (1909). Isocystine as given by Gabriel (1905) is much more labile than cystine obtained from keratin by hydrolysis. We have at present in this laboratory organic sulphur compounds not related to cystine which will liberate sulphur with very dilute alkali and no heating.

After some experimenting the following test for loosely bound sulphur in pituitary extracts was evolved. To 2 cubic centimeters of the dilute acetic acid extract in a small test tube, there were added 0.1 cubic centimeter of half-saturated or saturated lead acetate solution and 1 centimeter of sodium hydroxide (usually normal), and the tube was placed in boiling water. Potent extracts begin to brown in 15 seconds and give a black precipitate within two to five minutes, while inactive preparations do not show such a coloration even if kept in boiling water for 15 minutes. Extracts of five samples of standard powdered pituitary, prepared at the Hygienic Laboratory, and earlier referred to as preparations K_2, I_2, J_2, M_2, and N_2, gave a speedy and decisive precipitation of lead sulphide. The fresh gland extract (D) behaved likewise.

The first trials were carried out with 5 N sodium hydroxide. These tests demonstrated (1) that the acetic acid extracts of the posterior lobe contained reactive sulphur, as evidenced by the quick formation of lead sulphide; (2) that extracts of the anterior lobe contained little if any highly reactive sulphur, though in a few cases they did contain sulphur demonstrable by boiling with strong sodium hydroxide; (3) that the reactive sulphur appeared to stand in some relation to physiological activity, since extracts of inactive posterior powders failed to give the sulphide reaction.

TABLE 1.—*Loosely bound sulphur in posterior pituitary extracts (using 5 N sodium hydroxide)*

Sample	Identification notation	Concentration of extract	PbS test in 2 to 5 minutes	Pressor test
1	L	1 c. c.=10 mg. powder	+	+
2	A	1 c. c=10 mg. powder	−	[1] −
3	E	1 c. c.=20 mg. powder	−	−
4	N_2	1 c. c.=20 mg. powder	++	++
5	M_2	1 c. c.=10 mg. powder	+	+
6	M	1 c. c.=20 mg. powder	−	[2] −
7	PC 1544	1 c. c.=10 mg. powder	Slight	Slight.
8	PC 1469	1 c. c.=10 mg. powder	Very slight	Very slight.
9	PC 1483	1 c. c.=10 mg. powder [3]	+	+
10	PC 1556	1 c. c.=10 mg. powder	Slight	Slight.

[1] A is a commercial sample labeled "Pituitary body desiccated."
[2] M is a commercial sample labeled "Hypophysis cerebri."
A and M were tested by the oxytocic method only.

TABLE 2.—*Comparison of extracts of posterior and anterior lobes of the pituitary body in relation to loosely bound sulphur (using 5 N sodium hydroxide)*

	Lobe	Identification notation	Lead sulphide, 1 to 5 minutes		Lobe	Identification notation	Lead sulphide, 1 to 5 minutes
1	Posterior	1544	+	13	Posterior	1553	+
2	Anterior	1543	–	14	Anterior	1552	–
3	Posterior	1469	Faint.	15	Posterior	1592	Slight.
4	Anterior	1471	Brown +.	16	Anterior	1591	–
5	Posterior	1483	+	17	Posterior	1548	+
6	Anterior	1482	–	18	Anterior	1547	–
7	Posterior	1556	Slight	19	Posterior	1560	+
8	Anterior	1555	–	20	Anterior	1559	–
9	Posterior	1617	+	21	Posterior	1517	+
10	Anterior	1616	Brown +.	22	Anterior	1562	–
11	Posterior	1607	+	23	do	1462	+ slight brown.
12	Anterior	1606	–				

Using 5 N sodium hydroxide and a short heating period (2 to 5 minutes), the lead sulphide test was carried out on extracts of 16 samples of posterior pituitary powders and similar extracts of 12 anterior lobe preparations. Of the 16 posterior lobe preparations listed in Tables 1 and 2, the extracts of 12 gave a strong lead sulphide precipitate in from 1 to 3 minutes, 2 gave a faint reaction, and 3 were negative.

The posterior lobe extracts A, E, and M of Table 1, which gave a negative lead sulphide test, proved to be physiologically inert. Of the two extracts giving a faint lead sulphide test, one, No. 1469, showed but a trace of activity, physiologically, while the other, No. 1592 (Table 2), showed about 30 per cent activity as compared with a standard extract.

Sample No. 1592, which gives, as far as qualitative judgment goes, only a slight sulphide reaction, has as good physiological activity as some other samples which have given a strong lead sulphide test. While calling attention to this anomaly in our work we reserve judgment for further study of a quantitative nature.[1] Of the extracts of the 12 anterior powders, 9 were entirely negative, while 3 gave a definite positive test. The anterior extracts which gave indications of a positive lead sulphide test were tested physiologically and were found devoid of pressor activity.

As previously stated, the more dilute the alkali used and the shorter the time necessary to give a positive lead sulphide test in the presence of lead acetate, the more labile is the sulphur in question. Since heating with 5 N sodium hydroxide would split off more or less sulphur from compounds, such as cystine, which, in the light of recent work on labile sulphur, have only a slight lability, the chemical tests were repeated with weaker alkali. As a result of numerous experiments, it was found that N sodium hydroxide was very satis-

[1] The occurrence of nonspecific pressor amines may be mentioned as a possible cause of the discrepancy.

factory for the demonstration that extracts of the posterior lobe of the pituitary gland contained highly reactive sulphur. Thus, as shown in Table 3, with this modification of the test the extracts of the anterior lobe gave no reaction for highly reactive sulphur, while the extracts of the posterior lobe gave a sharp distinctive precipitation of lead sulphide within five minutes' heating.

As may be seen from Table 4, extracts of standard powders give a quick and sharp lead sulphide reaction, certain extracts, inactive physiologically, give little if any lead sulphide, and the commercial powders are less reactive than the standard powders, both physiologically and chemically. The work with the various samples of posterior pituitary is taken as a strong suggestion that a close relationship holds between the reactive sulphur and the physiological activity.

Cystine (0.5 milligram per cubic centimeters of 0.1 N hydrochloric acid), under the conditions given in Table 3, does not give a positive lead sulphide test. After 10 minutes' heating, cystine shows only a trace, if any, of lead sulphide. Glutathione, on the other hand, a peptide of cystine and glutamic acid in a concentration of only 1 milligram per cubic centimeter 0.1 N hydrochloric acid, gives a quick, sharp lead sulphide test.

It would seem that, in contrast to extracts of the anterior lobe or of inactive posterior lobe powders, the extracts of the active posterior lobe powders contain a peptide type of sulphur perhaps of the glutathione type. The less reactive sulphur, demonstrable in some cases of anterior lobe extracts (with the use of strong alkali or long boiling), must belong in all probability to more stable sulphur compounds.

TABLE 3.—*Comparison of extracts of posterior and anterior lobes of the pituitary body in relation to loosely bound sulphur (using N sodium hydroxide)*

	Lobe	Identification mark	Lead sulphide, 1 to 5 minutes		Lobe	Identification mark	Lead sulphide, 1 to 5 minutes
1	Posterior	1544	+	15	Posterior	1592	Slight.
2	Anterior	1543	−	16	Anterior	1591	−
3	Posterior	1469	Faint.	17	Posterior	1548	+
4	Anterior	1471	−	18	Anterior	1547	−
5	Posterior	1483	+	19	Posterior	1560	+
6	Anterior	1482	−yellow precipitate.	20	Anterior	1559	−
				21	Posterior	1517	+
7	Posterior	1556	+slight.	22	Anterior	1562	−
8	Anterior	1555	−	23	do	1462	−
9	Posterior	1617	+	24	Posterior	K_2	+
10	Anterior	1616	−slight yellow precipitate.	25	do	I_2	+
				26	do	J_2	+
11	Posterior	1607	+	27	do	M_2	+
12	Anterior	1606	−	28	do	N_2	+
13	Posterior	1553	+	29	do	L	+
14	Anterior	1552	−	30	do	D	+

TABLE 4.—*Relation of reactive sulphur in posterior pituitary to physiological activity (using N sodium hydroxide)*

No.	Preparation	Physiological activity in terms of standard pituitary	Concentration milligrams powder per cubic centimeter	Lead sulphide reaction	Remarks
1	M_1	100	10	Strong	These standard extracts gave a quick and decisive lead sulphide reaction, browning in 15 to 30 seconds and a good precipitate of PbS in 3 minutes.
2	N_1	100	10	do	
3	I_1	100	5	do	
4	J_1	100	5	do	
5	K_1	100	5	do	
6	L	100	10	do	
7	D	100	7	do	
8	1517	60	10	Good	Commercial powder.
9	1483	80	10	do	Do
10	1553	50	10	do	Do.
11	1544	25	10	Slight	Do.
12	1556	20	10	do	Do.
13	1592	30	10	Very slight	Do.
14	A [1]	Inert.	20	Negative	Do.
15	M [2]	Trace.	20	do	Do.
16	E	Trace.	20	do	Do.
17	1469	Trace.	10	Very faint	Do.

[1] This preparation was labeled "Pituitary body desiccated."
[2] Labeled "Hypophysis cerebri"

INACTIVATION OF EXTRACTS BY HEATING WITH HYDROCHLORIC ACID

Abel and Nagayama (1920) found that pituitary extracts acidified to the extent of 0.5 per cent hydrochloric acid and boiled for half an hour lost practically all of their physiological activity. Accordingly, an experiment was made by us to determine what effect heating an active extract with 0.5 per cent hydrochloric acid would have on the reactive sulphur. Eight cubic centimeters of a 1 per cent extract of standard powdered pituitary, which gave a prompt and strong lead sulphide test, were treated with 0.21 cubic centimeters of 20 per cent hydrochloric acid to form a solution containing approximately 0.5 per cent hydrochloric acid. This solution was boiled for one hour under reflux condenser. Two cubic centimeters of the boiled solution in a small test tube were treated in the usual manner with 0.1 cubic centimeter half-saturated lead acetate solution and 1 cubic centimeter N sodium hydroxide, and the tube was placed in boiling water. A strong positive sulphide reaction occurred within three minutes. Physiologically, however, the extract was found to have lost most of its activity by the heating with 0.5 per cent hydrochloric acid.

If it is assumed that the reactive sulphur of post-pituitary extracts is not an incidental matter, but is rather directly associated with the physiological activity of the gland, then the discrepancy just noted—the loss of physiological activity on heating with dilute hydrochloric acid without noticeable effect on the lead sulphide reaction—must be explained. A possible explanation is that the active principle is a complex, one part of which contains labile sulphur. The labile sul-

phur part is not injured by the short heating with the dilute acid, while other components of the complex, essential for the known activity, are either split off or are chemically changed. This phase of the question we can not deal with now, but shall content ourselves by stating the fact that heating with dilute acid inactivates the extract but does not destroy the groups containing highly reactive sulphur.

SUMMARY

As the investigation stands, the tests on extracts of the posterior pituitary lobe showed that they contained highly reactive sulphur (reactive in the presence of N sodium hydroxide), while extracts of the anterior lobe did not. Secondly, certain extracts of the posterior lobe, which were found to have little or no physiological activity, were negative in the lead sulphide test. Of the many tests made, one posterior lobe extract (No. 1592) gave an anomalous reaction in that it gave only a slightly positive lead sulphide test, while physiologically it was found to be relatively fairly active. In general, there was a very remarkable agreement between the physiological test, as measured by the rise in blood pressure when injected into anesthetized dogs, and the chemical test—that is, quick formation of lead sulphide when heated with N sodium hydroxide and lead acetate.

Whether this agreement is coincidental or is an indication that the physiological activity of the posterior pituitary is tied up with the presence of highly reactive sulphur compounds must remain for further investigation, of a quantitative nature, which is now being planned. In either case the test for highly reactive sulphur should be useful in the isolation and purification of the active principles.

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COURT DECISION RELATING TO PUBLIC HEALTH

Sewer district act held constitutional.—(Missouri Supreme Court; State ex rel. Gentry, Atty. Gen., *v.* Curtis et al., Sup'rs of Webster Groves General Sewer Dist. No. 1 of St. Louis County, 4 S. W. (2d) 467; decided March 17, 1928.) An act approved March 25, 1927 (Missouri Laws 1927, pp. 439–465), authorized the formation of sewer districts in counties having 75,000 or more population. A quo warranto proceeding was brought to oust certain persons as supervisors of a sewer district, it being contended that the above-mentioned act, under which the supervisors held office, was unconstitutional. Numerous grounds of unconstitutionality were urged, but the supreme court ruled against them all, thus holding the law to be a valid enactment.

PUBLIC HEALTH ENGINEERING ABSTRACTS

We Want Pure Air in Our Towns. Louis Forest. *The World's Health*, vol. 9, No. 3, March, 1928, pp. 86–88. (Abstract by Leonard Greenburg.)

The author feels that we should make an effort to furnish city dwellers with pure air just as we furnish them with pure water. On March 22, 1926, he says, two members of the French Academy presented the following analysis of material which fell on a gauge placed in the center of Paris:

	Grs per square meter
Carbon	2.659
Hydrocarbons	1.824
Sulphuric acid	2.432
Chlorine	.253
Ammonia	.021

A further analysis made at Vitry disclosed 1.592 kilograms of soot to the square meter during the month of February. The author ascribes this latter figure to the use of coal rich in ash. The reaction of the distillation by-products of coal with Paris water which has been purified by chlorine is such as to produce an iodoform taste in the water sufficient to render the liquid, at times, undrinkable, according to the author.

A draft law has been brought before the Chamber of Deputies which will permit the authorities to proceed to study this problem and remedy the present state of affairs.

Quantitative Measurements of the Inhalation, Retention, and Exhalation of Dusts and Fumes by Man: I. Concentrations of 50 to 450 Milligrams per Cubic Meter. P. Drinker, R. M. Thomson, and J. L. Finn. *Journal of Industrial Hygiene*, vol. 10, No. 1, January, 1928, pp. 13–25. (Abstract by Leonard Greenburg.)

The purpose of this study was to determine quantitatively the retention of certain representative dusts and fumes by the lungs of persons forced to respire them. Zinc oxide of a particle size of 0.4 microns, Kadox, which is zinc oxide having a particle size of 0.15 microns, and marble dust, having a particle size of 0.3 to 6 microns, were utilized as the representative dusts. Each of these dusts was set up in a 1,600-cubic-foot gas cabinet. The subjects were seated outside of the cabinet and derived their supply of air containing the dust from the cabinet. The quantity of dust which was exhaled was determined by means of an electric precipitator, while the volume of air was found by the use of a spirometer. Concentrations of dust from 50 to 450 milligrams per cubic meter were used with exposures of from 5 to 40 minutes and with respirations from 6 to 18 per minute. Under these conditions the percentage retention for all three dusts averaged 55, with a standard deviation of 9.4 This study appears to be a very excellent and accurate piece of work.

Studies in School Ventilation. R. F. Heath and J. S. Patterson. *Contract Record and Engineering Review*, vol. 42, No. 1, January 4, 1928, pp. 8–13. (Abstract by R. E. Thompson.)

A description and discussion of observations made in a school building in Toronto. The heating equipment consists of low-pressure boilers for heating by direct radiation only. The ventilation vent, housed in the basement, comprises tempering coils, air washer of spray type, reheater and fan, with ducts to each room. Ozone can be introduced between the tempering coils and the washer. The air can be recirculated, or fresh air can be introduced into the system. The observations made included temperature, humidity, and wet and dry kata thermometer readings. The effects noted of temperatures above the "effective temperature" are described. Odors are not removed to any great extent by the air washer. Introduction of 0.013 p. p. m. of ozone effected some improvement, but did not eliminate all odors.

Atmospheric Pollution with Arsenical Dust. G. Sowden. *The Journal of State Medicine*, vol. 35, No. 11, November, 1927, pp. 668–670. (Abstract by Leonard Greenburg.)

This study arose because of a complaint that the dust from a power generating station was a nuisance and that it contained arsenic to the extent of 125 parts per million. Accordingly, samples of dust were taken from the roof, rain-water gutters, and chimney shaft of the power plant and several factories in the neighborhood. The pulverized coal used at the power plant contained but 3 parts of arsenic per million, whereas the samples from the roof of the plant contained from 50 to 175 parts, from rain-water gutters from 100 to 200 parts, and from flue dust from 7 to 500 parts. In spite of the fact that the pulverised coal apparently contained so little arsenic, it is the author's belief that all of this arsenic

originated in the coal that was being burned. It is pointed out that various types of coal may contain considerably larger amounts of arsenic than found here.

The question arises as to the health hazard brought about by the presence of this amount of arsenic in the furnace dust discharged in the atmosphere. It is conceivable that a workman might inhale more than that amount of arsenic which is specified as being the maximum permitted on imported apples. The requirements for apples at the present time specify that more than one one-hundredth of a grain of arsenic per pound of apples is undesirable. The author concludes that workmen engaged in cleaning out furnace flues would doubtless inhale more than this quantity of dust, but, on the other hand, there appears to be no knowledge of any injury having arisen from this cause.

In conclusion, the author points out that the public health smoke abatement act should tend to lessen atmospheric pollution of this nature.

Experiments on the Ventilation of Small Bedrooms. A. H. Barker. *Gas. J.* 180, 193–5; *Gas World* 87, 359–60 (1927). Abstract by R. W. Ryan in *Chemical Abstracts*, vol. 22, No. 1, January 10, 1928, p. 130.

"Three men slept in a room of 1,200 cubic feet capacity. At the start of the night the CO_2 content of the air was 4 parts per 10,000. With no ventilation the CO_2 increased to 27 parts per 10,000; with a window open 3 inches, to 20 parts; and with the window open 12 inches, to 11 parts, CO_2 per 10,000. With a small gas heater in a fireplace, connected with a chimney, the CO_2 increased to only 8 parts per 10,000."

The School Ventilation Study in Syracuse, New York. Thomas J. Duffield. *American Journal of Public Health and the Nation's Health*, vol. 18, No. 3, March, 1928, pp. 326–330. (Abstract by Leonard Greenburg.)

In this study the efficiencies of window and mechanical ventilation are contrasted on the basis of the respiratory disease associated with their use in the schools of Syracuse, N. Y.

Six schools, three of each type, were studied over the winter period 1926–27. The author brings out the fact that unless the factors of race and age are approximately equal in both types of schools one is not warranted in drawing a conclusion from rates of respiratory illness absenteeism that one type of ventilation is more favorable than the other. Because the original two groups of 3 schools each were not balanced in these respects, the author, by eliminating 2 schools, leaving a resultant group of 4, has balanced up these factors. The resulting group of four schools yielded the following results:

Consolidated attendance and health records in two mechanically ventilated and two naturally ventilated schools in which the effects of race and age are approximately balanced

	Mechanically ventilated schools [1]	Naturally ventilated schools [1]	Excesses in mechanically ventilated schools
			Per cent
Total absences	7.0	5.4	29
Absences due to respiratory illness	2.9	2.2	32
Respiratory illness among pupils present	8.8	7.8	13
All respiratory illness	11.7	10.0	17

[1] Per cent of total pupil sessions.

The author closes by pointing out that even with this somewhat refined treatment of his data one is hardly warranted from his study in drawing the conclusion that natural ventilation of schools is more healthful than mechanical ventilation.

Failure of Slow Sand Filtration in Madras City.—J. W. Madeley. *The Surveyor*, vol. 72, No. 1873, December 16, 1927, pp. 593–595. (Abstract by R. E. Thompson.)

This article gives a description of the water works of Madras, India, and of the difficulties experienced in the operation of the slow sand filters, together with an outline of suggested improvements. The source of supply is Red Hills Lake, situated 7 miles from the filter plant. The numerous villages situated on the watershed have no drainage systems, and during the rainy seasons their filth is washed directly into the lake without treatment. The water, consequently, is of poor quality. Vibrios have been found on a number of occasions. The average rainfall is 37 inches per annum. The water works were constructed to supply 25 gallons of water per capita per day, to a population of 660,000, and consist of an intake tower, a 7-mile underground conduit of concrete and brickwork, 17 open slow sand filters with total area of 8¼ acres, 4 underground filtered-water tanks with total capacity of 6.5 m. g., a 1.5 m. g. elevated steel balancing tank, and a cast-iron pipe distribution system throughout the city. Most of these works were put in commission about 1914–15.

Filters Nos. 1–14 are each 200 by 100 feet, and Nos. 15–17 are 200 by 133 feet. The filtering medium consists of two layers of broken stone varying from ¾ to ⅛ inch in size, 4 inches of coarse sand and 2 feet 4 inches of fine sand ($\frac{1}{80}$ to $\frac{1}{40}$ inch). The depth of water varies from 3 feet 10 inches to 4 feet 9 inches. The filtering layer consists of 2 distinct portions, both of which affect the rate of flow: (1) The sedimentary skin which forms on surface of sand, and (2) the gelatinous layer which consists of the top layer of sand. The former sometimes forms as a feltlike skin which, on drying, curls up in sheets about 5 feet square. There is normally no growth of algae in this skin; but on occasions when depth of water has been reduced for several days, rapid growth has occurred. The gelatinous layer is usually 1½ inches deep below sand surface and sometimes extends to a depth of 9 inches. When filter first becomes clogged, it can be restored for a time by simply removing the sedimentary layer. This may sometimes be repeated several times before removing and washing the surface sand. When the depth of filtering sand is reduced to 15 inches by removing surface layer for washing, the bed is made up to original depth with clean sand. To prevent penetration of finely divided organic matter into the sand of a newly washed filter, water is allowed to stand on surface for 24 hours to permit suspended matter to settle, and for first three days the rate of filtration is gradually increased from ½ inch to 4 inches, vertical, per 24 hours.

During the hot weather, hydrogen sulphide is produced in the filters. When the filters are stopped, a black layer about 2 inches thick is found at the bottom of the fine sand, immediately above the coarse sand; and occasionally a similar layer immediately below the surface of the fine sand. This is probably iron sulphide, as the sand contains iron. Liberation of the hydrogen sulphide through the sand of the filter causes formation of craterlike holes in the sand surface, which, of course, interfere with the efficiency. The presence of the hydrogen sulphide in the filtered water prevents satisfactory chlorination.

After studying the situation, the author recommended that the slow sand filters be converted into rapid sand filters by emptying and using filters Nos. 1–14 as preliminary settling basins, Nos. 15 and 17 as coagulation basins for alum treatment, and dividing No. 16 into 14 rapid sand filters to be operated at a rate of 100 vertical inches per hour. This would give a net capacity of 20 m. g. d., to supply a consumption of 17 m. g. d.

In spite of the recommendation, the corporation decided to extend the slow sand filters, but the Government refused to assist financially. As a result no action has been taken, and there is no propsect of any improvement in the near future.

Sludge Thickening and Discharge. A. W. Bull and G. M. Darby. *Water Works*, vol. 67, No. 2, February, 1928, p. 76. (Abstract by H. B. Hommon.)

In some laboratory tests it was found that the slow stirring of dilute suspensions of mud in water caused a concentration of sludge in 10 hours that was not equalled in 47 to 75 hours of quiescent settling. Tests were made with an experimental Dorr clarifier in which three methods of discharging sludge were tried: (1) Discharge through a swivelled pipe which could be readily swung up or down to control the discharge head; (2) combinations of the swivel pipe and different sized orifices; (3) by the use of a diaphragm pump.

The conclusions drawn from the tests were: (1) The clarifier demonstrated its ability to thicken river mud and to discharge the sludge with a water loss of less than 1 per cent; (2) for the handling of this type of sludge, the piping should be free from shoulders or any obstructions, flange joints being recommended; (3) either orifice or swivel discharge may be used, but either will require careful manipulation and fairly close attention; (4) the diaphragm pump handled and controlled the sludge discharge without any difficulty, and could consistently remove sludge of a greater density than could be continuously discharged through an orifice or through the swivel pipe.

Value of Preliminary Sedimentation in Water Purification. Frank Bachmann. Proceedings of Ninth Texas Water Works Short School, January, 1927, pp. 173–180. (Abstract by H. D. Cashmore.)

An article that should be of particular interest to those operators of water purification plants whose water is taken from rivers of the Mississippi drainage basin where wide fluctuations of turbidity is experienced.

The advantages of preliminary sedimentation in the treatment of turbid waters are as follows:

1. The removal of the bulk of the turbidity, thereby reducing the load on the coagulation basins and consequently the cost of cleaning these basins.

2. Presettling gives a water low in turbidity, which (*a*) results in smoother plant operation, (*b*) reduces materially the cost of chemicals for coagulation and softening, (*c*) reduces cost of water wasted with sludge as this water has not been treated with chemicals.

An interesting discussion of the above advantages is given, with several charts and tables to illustrate the points brought to light.

Figure A is a graph showing the reduction of turbidity obtained with a short period of sedimentation at several cities on the Mississippi, Missouri, and Arkansas Rivers. Figure B shows the form in which the mass of data available at nearly all filtration plants regarding turbidity and alkalinity and lime and alum consumption can be represented graphically. In Figure C some interesting data dealing with lime consumption for different turbidities for deduction of bicarbonate alkalinity are shown in graphs.

Two tables showing the operating results at Little Rock, Ark., and St. Louis, Mo., where presedimentation is used, are given to show what results can be obtained. The last table gives a comparison between the yearly operating costs at Waco, Tex., for the years 1918–19 and 1919–20, which shows the saving made by the installation of a sedimentation basin.

DEATHS DURING WEEK ENDED MAY 19, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended May 19, 1928, and corresponding week of 1927. (From the Weekly Health Index, May 23, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended May 19, 1928	Corresponding week, 1927
Policies in force	71, 199, 412	67, 703, 113
Number of death claims	15, 244	13, 565
Death claims per 1,000 policies in force, annual rate	11. 2	10. 4

Deaths from all causes in certain large cities of the United States during the week ended May 19, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 23, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended May 19, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended May 19, 1928 [2]
	Total deaths	Death rate [1]		Week ended May 19, 1928	Corresponding week, 1927	
Total (70 cities)	8, 410	14. 3	12. 3	925	721	75
Akron	55			9	7	98
Albany [3]	52	22. 6	16. 1	6	3	123
Atlanta	58	11. 9	14. 2	8	7	
White	27		8. 0	4	3	
Colored	31	(4)	28. 9	4	4	
Baltimore [3]	243	15. 3	15. 3	29	20	92
White	197		13 3	23	13	92
Colored	46	(4)	26. 8	6	7	94
Birmingham	83	19. 5	18. 5	8	10	68
White	40		16. 1	4	8	55
Colored	43	(4)	22. 2	4	2	90
Boston	273	17. 9	14. 0	41	25	113
Bridgeport	49			3	3	55
Buffalo	161	15. 1	16. 6	21	24	90
Cambridge	21	8. 7	10. 1	1	3	18
Camden	35	13. 5	9. 0	4	4	64
Canton	28	12. 5	8. 3	5	1	119
Chicago [3]	859	14. 2	11. 9	90	71	77
Cincinnati	146	18. 5	15. 6	14	8	85
Cleveland	224	11. 6	9 3	19	20	52
Columbus	91	16. 0	17. 4	11	7	103
Dallas	39	9. 4	12 8	7	9	
White	25		10. 8	6	9	
Colored	14	(4)	26. 6	1	0	
Dayton	50	14. 2	12. 4	10	7	166
Denver	87	15. 5	14. 0	9	5	
Des Moines	34	11. 7	9. 1	2	1	38
Detroit	349	13. 2	11. 8	52	42	80
Duluth	27	12. 1	15. 0	0	2	0
El Paso	35	15. 5	12. 9	10	10	
Erie	26			0	4	0
Fall River [3]	35	13. 6	8. 7	7	3	120
Flint	27	9. 5	9 5	7	3	89
Fort Worth	35	10. 9	10. 8	2	5	
White	27		8. 3	1	5	
Colored	8	(4)	29. 3	1	0	
Grand Rapids	43	13. 7	10. 8	4	7	60
Houston	55			6	3	
White	35			5	2	
Colored	20	(4)		1	1	
Indianapolis	108	14. 8	10. 9	7	8	53
White	88		10. 1	7	6	61
Colored	20	(4)	16. 3	0	2	0
Jersey City	98	15. 8	11. 8	10	6	72

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, May 18, 1928.
[4] In the cities for which deaths are shown by color, the colored

Deaths from all causes in certain large cities of the United States during the week ended May 19, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 23, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended May 19, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended May 19, 1928
	Total deaths	Death rate		Week ended May 19, 1928	Corresponding week, 1927	
Kansas City, Kans	37	16.4	13.3	3	2	63
White	25		13.0	2	2	49
Colored	12	(4)	14.8	1	0	145
Kansas City, Mo	99	13.2	15.7	10	10	71
Knoxville	21	10.4	11.7	2	3	43
White	16		11.6	2	3	48
Colored	5	(4)	12.8	0	0	0
Los Angeles	259			25	31	72
Louisville	146	23.2	12.4	6	1	50
White	113		11.9	6	1	57
Colored	33	(4)	14.9	0	0	0
Lowell	30	14.2	10.9	3	3	63
Lynn	22	10.9	9.0	1	3	25
Memphis	66	18.1	22.2	8	5	94
White	27		18.5	4	1	75
Colored	39	(4)	28.8	4	4	125
Milwaukee	132	12.7	11.0	20	15	89
Minneapolis	109	12.5	11.2	12	11	72
Nashville	38	14.3	15.9	4	0	68
White	26		12.1	3	0	64
Colored	12	(4)	25.5	1	0	60
New Bedford	23	10.1	10.9	2	1	43
New Haven	49	13.6	9.6	3	3	42
New Orleans	165	20.1	18.8	16	14	77
White	95		15.4	6	6	44
Colored	70	(4)	28.4	10	8	145
New York	1,784	15.5	12.5	203	152	82
Bronx borough	222	12.2	8.8	24	13	73
Brooklyn borough	600	13.6	11.3	63	56	63
Manhattan borough	746	22.3	17.3	90	67	107
Queens borough	165	10.1	9.3	24	13	97
Richmond borough	51	17.7	13.5	2	3	36
Newark, N. J	119	13.1	8.4	11	10	57
Oakland	65	12.4	10.1	5	2	54
Oklahoma City	20			0	5	
Omaha	56	13.1	11.7	7	2	81
Paterson	54	19.5	12.0	6	2	104
Philadelphia	512	13.0	11.1	50	41	67
Pittsburgh	196	15.3	12.7	18	17	59
Portland, Oreg	70			4	1	48
Providence	61	11.1	11.5	4	8	35
Richmond	40	10.8	15.0	2	2	26
White	29		13.0	2	2	41
Colored	11	(4)	19.7	0	0	0
Rochester	71	11.3	12.2	12	12	97
St. Louis	208	12.8	12.1	19	14	64
St. Paul	45	9.3	12.1	3	7	29
Salt Lake City [3]	26	9.9	10.0	5	2	82
San Antonio	66	15.8	11.8	14	10	
San Diego	53	23.2	23.1	2	4	38
San Francisco	153	13.7	12.6	8	8	50
Schenectady	22	12.3	10.1	3	3	94
Seattle	70	9.6	6.7	9	3	92
Somerville	21	10.7	10.3	8	0	277
Spokane	22	10.5	11.5	1	0	26
Springfield, Mass	52	18.1	11.0	8	2	127
Syracuse	75	19.7	15.1	11	3	134
Tacoma	16	7.6	11.2	1	1	26
Toledo	81	13.5	10.8	7	6	67
Trenton	42	15.8	10.3	6	2	102
Utica	28	14.0	15.6	3	7	66
Washington, D. C	146	18.8	11.8	7	8	40
White	95		10.2	6	2	50
Colored	51	(4)	16.5	1	6	18
Waterbury	21			2	2	58
Wilmington, Del	30	12.2	9.9	6	5	158
Worcester	61	16.1	12.8	6	4	73
Yonkers	28	9.9	5.7	1	1	23
Youngstown	34	10.2	6.5	5	1	67

[3] Deaths for week ended Friday, May 18, 1928.

[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State, or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 26, 1928, and May 28, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 26, 1928, and May 28, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927
New England States:								
Maine	2	12	22	1	35	143	0	0
New Hampshire	1				16		0	
Vermont		1			45	103	0	0
Massachusetts	61	75	52	6	937	470	4	4
Rhode Island	1	18			234	8	0	0
Connecticut	26	30	27	1	354	57	2	[illegible]
Middle Atlantic States								
New York	309	431	[1] 78	[1] 16	4,024	928	26	8
New Jersey	145	103	21	8	1,894	78	5	6
Pennsylvania	177	222			2,767	809	12	3
East North Central States:								
Ohio	42		204		1,089		2	
Indiana	13	25	32	1	447	109	0	0
Illinois	111	104	157	21	244	728	12	5
Michigan	72	76	5	5	941	202	5	1
Wisconsin	26	35	820	59	61	867	3	10
West North Central States:								
Minnesota	11	17	5	4	111	110	4	1
Iowa	10						1	
Missouri	30	23	13	4	496	128	14	4
North Dakota	1	5	28		25	30	1	0
South Dakota	1	6	2	1	12	102	0	0
Nebraska	3	2	29	5	44	185	1	0
Kansas	5	8	1	22	150	753	7	1
South Atlantic States								
Delaware					20	8	0	0
Maryland [2]	81	50	38	8	568	24	0	0
District of Columbia	27	26	1	2	191	10	0	1
Virginia								
West Virginia	12	9	248	3	56		1	1
North Carolina	19	11			904	1,586	1	1
South Carolina	14	8	469	297	211	231	0	0
Georgia	6	6	102	23	128	73	1	0
Florida	9	11	7	2	133	113	1	[illegible]
East South Central States:								
Kentucky	8		3		160		0	
Tennessee	10	4	119	11	140	49	[illegible]	2
Alabama	5	24	219	37	361	221	1	0
Mississippi	7	6					[illegible]	

[1] New York City only. [2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 26, 1928, and May 28, 1927—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927
West South Central States:								
Arkansas	5	4	170	81	178	50	8	0
Louisiana	7	21	29	13	118	33	2	1
Oklahoma [3]	12	5	200	43	256	317	4	1
Texas	11	23	33	20	116	102	0	0
Mountain States:								
Montana	3	5	1	-------	36	39	1	3
Idaho	-------	-------	-------	-------	1	-------	0	-------
Wyoming	-------	-------	2	-------	21	117	0	0
Colorado	8	6	-------	-------	126	202	0	0
New Mexico	1	6	-------	-------	50	167	1	0
Arizona	8	-------	-------	-------	9	31	0	0
Utah [1]	2	9	7	-------	-------	11	1	0
Pacific States:								
Washington	12	3	-------	1	78	310	5	7
Oregon	9	5	20	16	43	284	1	2
California	85	128	52	19	80	924	8	9

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927
New England States:								
Maine	0	0	19	34	0	0	2	3
New Hampshire	0	-------	9	-------	0	-------	0	-------
Vermont	0	0	6	3	1	0	1	0
Massachusetts	1	2	244	427	4	0	5	5
Rhode Island	0	0	27	12	0	0	2	1
Connecticut	0	0	78	4	2	0	1	5
Middle Atlantic States:								
New York	2	0	558	773	16	3	21	12
New Jersey	1	0	240	396	-------	0	5	3
Pennsylvania	1	0	443	461	1	0	18	21
East North Central States:								
Ohio	1	-------	151	-------	38	-------	6	-------
Indiana	0	0	67	70	89	165	8	1
Illinois	0	0	243	230	47	33	11	13
Michigan	1	0	255	237	13	37	3	5
Wisconsin	0	0	218	156	15	70	36	3
West North Central States:								
Minnesota	2	2	136	160	1	2	0	2
Iowa	0	-------	51	-------	52	-------	0	-------
Missouri	0	0	63	57	22	8	7	4
North Dakota	0	0	23	46	6	1	0	0
South Dakota	0	0	25	18	2	4	0	0
Nebraska	0	1	88	18	39	5	0	2
Kansas	0	0	103	56	60	19	1	3
South Atlantic States:								
Delaware	0	0	0	8	0	0	1	0
Maryland [1]	0	0	63	64	1	0	6	4
District of Columbia	0	0	46	15	4	1	0	1
Virginia	-------	0	-------	-------	-------	3	-------	-------
West Virginia	1	0	32	26	54	37	8	9
North Carolina	1	0	22	9	73	30	5	23
South Carolina	6	3	11	5	6	7	29	37
Georgia	0	1	11	11	0	22	18	36
Florida	0	0	1	5	1	40	6	21
East South Central States:								
Kentucky	0	-------	43	-------	40	-------	4	-------
Tennessee	0	0	11	8	32	9	12	16
Alabama	0	0	11	7	25	26	11	39
Mississippi	1	2	7	7	4	2	5	21
West South Central States:								
Arkansas	1	0	26	6	17	2	18	20
Louisiana	0	2	15	6	19	7	11	39
Oklahoma [3]	0	1	47	13	88	45	3	15
Texas	1	1	55	8	47	34	2	11

[1] Week ended Friday.

[3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 26, 1928, and May 28, 1927—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927
Mountain States:								
Montana	0	0	13	21	19	4	1	5
Idaho	0		6		7		0	
Wyoming	0	0	22	26	1	8	0	0
Colorado	0	0	34	132	10	6	1	2
New Mexico	0	0	14	23	1	0	3	1
Arizona	2	2	0	1	12	0	2	0
Utah [1]	0	0	5	15	6	2	0	0
Pacific States:								
Washington	2	0	18	44	33	34	6	0
Oregon	1	0	20	22	39	16	5	12
California	3	4	154	117	12	17	17	12

[1] Exclusive of Tulsa.

Report for Week Ended May 19, 1928

IOWA	Cases
Diphtheria	6
Measles	15
Scarlet fever	57

IOWA—continued	Cases
Smallpox	38
Typhoid fever	1

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April, 1928										
District of Columbia	2	64			775		0	156	6	1
Florida	0	35	55	20	309	5	1	50	29	26
Georgia	3	33	410	126	510	32	0	64	29	18
Illinois	51	509	884	1	819		2	1,255	124	33
Louisiana	3	98	199	113	893	54	0	34	88	47
Maine	1	11	15		127		0	94	0	2
Maryland	2	125	118	0	3,630		1	314	2	32
Minnesota	10	97	151		292		4	554	7	9
Missouri	30	150	369	1	1,739		1	438	275	20
New York	151	1,387		8	12,426		4	3,045	13	46
Ohio	31	429	690	1	3,951		5	1,031	182	25
Pennsylvania	33	686		1	8,907		5	1,938	13	35
Tennessee	4	55	1,274	48	1,937	25	2	116	132	[illegible]
West Virginia	0	66	128		708		0	135	217	28
Wisconsin	26	85	3,788		422		5	667	85	10
Wyoming	9	1	8		69		0	107	7	2

April, 1928

	Cases
Actinomycosis:	
Illinois	1
Anthrax:	
New York	1
Pennsylvania	1
Chicken pox:	
District of Columbia	55
Florida	246
Georgia	243
Illinois	1,071
Louisiana	30
Maine	102
Maryland	352
Minnesota	458
Missouri	239
New York	1,719
Ohio	964
Pennsylvania	1,647
Tennessee	111
West Virginia	203
Wisconsin	904
Wyoming	29
Dengue:	
Georgia	8
Dysentery:	
Georgia	11
Illinois	19
Louisiana	2
Maryland	2
New York	6
Tennessee	1
German measles:	
Georgia	1
Illinois	103
Maine	11
Maryland	241
New York	1,714
Ohio	67
Pennsylvania	517
Wyoming	1
Hookworm disease:	
Florida	146
Georgia	6
Louisiana	29
Lead poisoning:	
Illinois	6
Ohio	12
Leprosy:	
Illinois	1
Louisiana	1
Lethargic encephalitis:	
Georgia	1
Illinois	7
Maine	1
Maryland	3
New York	27
Ohio	4
Pennsylvania	7
Tennessee	2
Wisconsin	1
Mumps:	
Florida	92
Georgia	75
Illinois	1,149
Louisiana	10
Maine	154
Maryland	149

April, 1928—Continued

	Cases
Mumps—Continued.	
Missouri	577
New York	2,068
Ohio	1,362
Pennsylvania	3,531
Tennessee	343
Wisconsin	641
Wyoming	24
Ophthalmia neonatorum:	
Illinois	25
New York	4
Ohio	100
Pennsylvania	7
Paratyphoid fever:	
Illinois	1
Tennessee	2
Puerperal septicemia:	
Illinois	10
New York	27
Ohio	5
Pennsylvania	5
Rabies in animals:	
Maryland	3
Missouri	4
New York	20
Rabies in man:	
Illinois	2
Ohio	2
Pennsylvania	2
Tennessee	1
Rocky Mountain spotted or tick fever:	
Wyoming	6
Scabies:	
Maryland	1
Wyoming	4
Septic sore throat:	
Georgia	24
Illinois	8
Maine	4
Maryland	18
Missouri	23
New York	17
Ohio	75
Tennessee	1
Tetanus:	
Florida	4
Georgia	2
Illinois	3
Louisiana	1
Maryland	1
New York	1
Pennsylvania	5
Tennessee	1
Trachoma:	
Illinois	12
Louisiana	1
Missouri	11
New York	2
Ohio	8
Pennsylvania	4
Tennessee	6
Tularaemia:	
Georgia	2
Louisiana	5
Typhus fever:	
Florida	5

April, 1928—Continued

Undulant (Malta) fever:	Cases
Maine	1
Maryland	1
Vincent's angina:	
Illinois	1
Maine	3
Maryland	11
New York	85
Whooping cough:	
District of Columbia	32
Florida	32
Georgia	77
Illinois	1,070

April, 1928—Continued

Whooping cough—Continued.	Cases
Louisiana	36
Maine	91
Maryland	207
Minnesota	157
Missouri	185
New York	1,723
Ohio	549
Pennsylvania	1,109
Tennessee	145
West Virginia	45
Wisconsin	190
Wyoming	22

RECIPROCAL NOTIFICATIONS

Notifications regarding communicable diseases sent during the month of April, 1928, by departments of health of the States named to other State health departments

Disease	California	Connecticut	Illinois	Minnesota	New Mexico	New York	Washington
Diphtheria			1			3	1
Measles						1	
Rabies [1]						1	
Scarlet fever		1	1		1	4	
Smallpox			5			1	
Tuberculosis	5			42			
Typhoid fever			1			1	
Whooping cough					1		

[1] In animals.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 101 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,650,000. The estimated population of the 95 cities reporting deaths is more than 30,960,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended May 12, 1928, and May 14, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
41 States	1,225	1,547	
101 cities	733	1,037	861
Measles:			
40 States	18,357	12,997	
101 cities	8,330	3,587	
Poliomyelitis:			
41 States	32	20	
Scarlet fever:			
41 States	3,764	4,560	
101 cities	1,530	2,022	1,228
Smallpox:			
41 States	860	695	
101 cities	107	125	116
Typhoid fever:			
41 States	207	324	
101 cities	48	47	42
Deaths reported			
Influenza and pneumonia.			
95 cities	1,439	793	
Smallpox:			
95 cities	0	0	

City reports for week ended May 12, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha	52,700	19	0	0	0	0	2	0	1
Milwaukee	517,000	48	11	7	10	10	0	14	35
Racine	69,400	6	1	0	7	1	1	0	2
Superior	[1] 39,671	0	1	0	0	0	0	0	5
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	2	0	0	0	4	0	3	2
Minneapolis	434,000	30	15	9	0	7	94	140	13
St. Paul	248,000	8	12	0	0	6	7	15	12
Iowa:									
Davenport	[1] 52,469	1	0	0	0		0	0	
Des Moines	146,000	0	2	0	0		0	0	
Sioux City	78,000	2	1	0	0		4	22	
Waterloo	36,900	8	0	0	0		0	7	
Missouri:									
Kansas City	375,000	17	5	2	1	3	59	48	13
St. Joseph	78,400	1	0	0	0	0	2	6	9
St. Louis	830,000	32	38	16	0	0	303	12	
North Dakota:									
Fargo	[1] 26,403	3	0	0	0	1	0	0	2
Grand Forks	[1] 14,811	0	0	1	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	0	0	0	0		1	0	
Sioux Falls	[1] 30,127	0	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	8	1	0	0	0	1	15	0
Omaha	216,000	10	2	1	0	0	0	0	5
Kansas:									
Topeka	56,500	9	1	0	2	0	12	18	1
Wichita	92,500	11	1	0	0	0	0	1	2
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	1	2	0	0	0	13	4	5
Maryland:									
Baltimore	808,000	61	22	23	10	0	501	67	0
Cumberland	[1] 33,741	4	0	0	2	0	5	0	0
Frederick	[1] 12,035	0	0	0	0	0	34	0	0
District of Columbia:									
Washington	528,000	11	12	14	4	2	181	0	15
Virginia:									
Lynchburg	[3] 38,493	3	1	0	0	0	23	8	1
Norfolk	174,000	5	1	0	0	0	41	10	5
Richmond	189,000	2	1	0	0	0	85	2	2
Roanoke	61,900	7	0	0	0	0	23	1	1
West Virginia:									
Charleston	50,700	2	0	1	0	1	3	0	2
Wheeling	[1] 56,208	7	1	0	0	0	7	1	4
North Carolina:									
Raleigh	[1] 30,371	1	1	1	0	0	23	0	0
Wilmington	37,700	1	0	0	0	0	1	0	2
Winston-Salem	71,800	4	0	0	0	0	12	15	3
South Carolina:									
Charleston	74,100	0	0	0	3	0	0	0	4
Columbia	41,800	4	0	1	0	0	0	21	1
Greenville	[1] 27,311	1	0	0	0	0	0	4	1
Georgia:									
Atlanta	(2)	8	1	3	18	0	18	8	2
Brunswick	[1] 16,809	0	0	0	0	0	1	0	0
Savannah	94,900	1	0	1	24	2	0	1	3
Florida:									
Miami	[3] 131,286	28	1	1	0	0	3	15	2
St. Petersburg	[3] 47,629		0			0			5
Tampa	102,000	5	1	3	0	0	1	2	0

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended May 12, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58, 500	6	0	1	0	1	1	0	4
Louisville	311, 000	1	3	1	4	0	101	7	5
Tennessee:									
Memphis	177, 000	8	2	2	6	1	9	10	6
Nashville	137, 000	0	1	2	0	8	28	1	5
Alabama.									
Birmingham	211, 000	5	1	1	117	8	40	4	17
Mobile	66, 800	0	0	0	2	1	18	0	0
Montgomery	47, 000	4	0	0	12		1	1	
WEST SOUTH CENTRAL									
Arkansas.									
Fort Smith	[1] 31, 643	1	0	0	0		0	0	
Little Rock	75, 900	5	0	0	1	0	6	3	0
Louisiana:									
New Orleans	419, 000	0	7	13	7	6	1	0	16
Shreveport	59, 500	2	1	0	0	0	22	0	7
Oklahoma:									
Oklahoma City	(2)	1	1	3	13	1	11	1	4
Tulsa	133, 000	18	1	0	0		8	12	
Texas:									
Dallas	203, 000	14	3	5	1	1	12	0	2
Fort Worth	159, 000	13	1	1	0	2	5	1	2
Galveston	49, 100	0	0	0	0	0	0	0	2
Houston	[1] 164, 954	2	3	4	0	0	31	0	7
San Antonio	205, 000	0	1	1	0	2	12	0	6
MOUNTAIN									
Montana:									
Billings	[1] 17, 971	0	0	0	0	0	0	0	0
Great Falls	[1] 29, 883	10	1	0	0	0	1	0	1
Helena	[1] 12, 037	1	0	1	0	0	0	0	3
Missoula	[1] 12, 668	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23, 042	2	0	0	0	0	0	0	0
Colorado:									
Denver	285, 000	59	10	4		1	109	119	11
Pueblo	43, 900	13	0	0	0	0	19	0	0
New Mexico:									
Albuquerque	[1] 21, 000	4	1	0	0	0	2	0	1
Utah:									
Salt Lake City	133, 000	18	4	2	0	2	0	0	0
Nevada:									
Reno	[1] 12, 665	0	0	1	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	34	5	4	0		54	4	
Spokane	109, 000	11	2	1	0		0	6	
Tacoma	106, 000	4	1	0	0	1	28	[illegible]	4
Oregon:									
Portland	[1] 282, 383	28	5	0	0	0	15	9	4
California:									
Los Angeles	(2)	76	41	19	24	3	24	[illegible]	[illegible]
Sacramento	73, 400	11	2	0	0	0	4	11	1
San Francisco	567, 000	16	10	16	3	1	18	27	3

[1] Estimated, July 1, 1926.

[2] No estimate made.

City reports for week ended May 12, 1928—Continued

Division, State and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	5	0	0	0	1	1	1	0	3	24
New Hampshire:											
Concord	1	1	0	0	0	0	0	0	0	0	7
Manchester	2	7	0	0	0	0	0	0	0	0	20
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	2
Massachusetts:											
Boston	63	77	0	0	0	22	1	0	0	39	208
Fall River	4	7	0	0	0	4	0	0	0	0	31
Springfield	6	22	0	0	0	1	0	0	0	10	45
Worcester	10	8	0	0	0	5	0	0	0	14	57
Rhode Island:											
Pawtucket	1	4	0	0	0	0	0	0	0	0	22
Providence	9	20	0	0	0	1	0	1	0	6	64
Connecticut:											
Bridgeport	11	1	0	0	0	2	0	0	0	0	39
Hartford	5	6	0	0	0	1	0	0	0	13	59
New Haven	7	0	0	0	0	5	1	0	0	11	80
MIDDLE ATLANTIC											
New York:											
Buffalo	19	42	0	0	0	12	1	0	0	20	154
New York	270	355	1	0	0	127	8	4	0	173	1,920
Rochester	18	9	0	0	0	1	0	0	0	5	88
Syracuse	9	7	0	0	0	3	0	0	0	40	75
New Jersey:											
Camden	6	3	0	0	0	1	0	0	0	0	24
Newark	25	32	0	0	0	7	1	0	0	29	131
Trenton	3	1	0	0	0	2	0	0	0	1	44
Pennsylvania:											
Philadelphia	88	87	0	0	0	35	4	1	0	97	574
Pittsburgh	28	36	0	0	0	15	0	0	1	23	214
Reading	2	12	0	0	0	0	0	0	0	6	30
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	18	45	2	3	0	12	1	0	0	13	177
Cleveland	38	28	1	0	0	19	1	2	0	61	200
Columbus	8	20	2	0	0	3	0	0	0	5	83
Toledo	12	4	3	0	0	6	1	0	0	3	91
Indiana:											
Fort Wayne	3	2	3	0	0	1	0	0	0	0	30
Indianapolis	9	21	13	7	0	9	0	0	0	6	106
South Bend	4	2	0	1	0	2	0	0	0	0	16
Terre Haute	3	0	0	4	0	2	0	0	0	0	21
Illinois:											
Chicago	116	71	2	4	0	54	3	1	0	97	926
Springfield	3	13	0	5	0	1	0	0	0	0	22
Michigan:											
Detroit	88	123	2	1	0	22	2	1	0	85	392
Flint	6	11	1	5	0	1	1	0	1	7	29
Grand Rapids	7	7	0	0	0	3	0	0	0	6	41
Wisconsin:											
Kenosha	3	0	0	0	0	0	0	0	0	14	8
Milwaukee	25	46	1	0	0	7	0	0	0	15	142
Racine	4	2	1	0	0	1	0	0	0	3	25
Superior	2	14	1	0	0	2	0	0	0	0	19
WEST NORTH CENTRAL											
Minnesota:											
Duluth	7	4	1	0	0	2	0	0	0	1	34
Minneapolis	41	28	6	0	0	3	1	1	0	15	110
St. Paul	22	12	3	0	0	4	0	0	0	40	88
Iowa:											
Davenport	1	3	2	3			0	0		0	
Des Moines	6	3	1	15			0	0		0	
Sioux City	2	0	2	0			0	0		1	
Waterloo	1	8	0	3			0	0		1	

City reports for week ended May 19, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL—con.											
Missouri:											
Kansas City	10	27	2	4	0	6	0	1	0	19	98
St. Joseph	3	3	0	0	0	2	0	0	0	1	52
St. Louis	32	31	4	5	0	9	0	1	0	14	305
North Dakota.											
Fargo	2	0	0	0	0	1	0	0	0	14	9
Grand Forks	1	4	0	0	------	------	0	0	------	0	------
South Dakota:											
Aberdeen	2	0	0	0	------	------	0	0	------	0	------
Sioux Falls	1	9	0	0	------	------	0	0	------	0	------
Nebraska:											
Lincoln	1	8	0	4	0	0	0	0	0	0	16
Omaha	4	4	9	4	0	1	0	1	0	0	44
Kansas:											
Topeka	2	8	0	1	0	1	0	0	0	9	11
Wichita	2	4	1	5	0	0	0	0	0	5	24
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	1	0	0	0	0	0	0	0	0	38
Maryland.											
Baltimore	33	26	1	0	0	0	2	3	0	37	239
Cumberland	1	0	0	0	0	0	0	0	0	0	13
Frederick	1	0	0	0	0	0	0	0	0	0	4
District of Col.:											
Washington	22	47	0	0	0	21	1	1	0	6	172
Virginia:											
Lynchburg	0	0	0	0	0	0	0	0	0	14	6
Norfolk	2	4	0	3	0	5	0	0	0	1	0
Richmond	4	3	0	1	0	0	1	0	0	0	47
Roanoke	1	0	1	0	0	0	0	0	0	1	16
West Virginia:											
Charleston	0	0	0	0	0	0	0	1	0	0	8
Wheeling	3	0	0	0	0	0	0	0	0	0	11
North Carolina:											
Raleigh	1	2	1	1	0	8	0	0	0	3	11
Wilmington	0	1	0	2	0	1	0	0	0	0	12
Winston-Salem	0	1	4	1	0	2	0	1	0	0	17
South Carolina:											
Charleston	0	0	1	2	0	2	0	1	0	7	33
Columbia	0	0	0	0	0	0	1	0	0	1	9
Greenville	0	1	1	0	0	0	0	0	0	0	8
Georgia:											
Atlanta	8	9	8	2	0	5	0	0	0	2	68
Brunswick	0	0	0	0	0	0	0	0	0	0	4
Savannah	0	0	0	0	0	0	0	1	0	1	31
Florida:											
Miami	0	1	1	0	0	0	1	1	0	0	10
St. Petersburg	0	------	0	------	0	1	0	------	0	------	12
Tampa	0	0	1	0	0	2	1	3	1	0	20
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	13	1	0	0	2	0	0	0	0	40
Louisville	7	15	1	0	0	3	1	1	0	1	67
Tennessee:											
Memphis	5	2	3	0	0	4	1	0	1	2	65
Nashville	2	0	0	0	0	4	1	1	0	1	47
Alabama:											
Birmingham	2	1	8	0	0	0	1	2	0	9	90
Mobile	0	0	1	0	0	0	0	0	0	0	23
Montgomery	0	0	0	0	------	------	0	0	------	0	------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0	------	------	0	0	------	2	------
Little Rock	1	8	0	0	0	1	0	0	0	[illegible]	0

City reports for week ended May 12, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL—contd.											
Louisiana:											
New Orleans	5	10	1	0	0	21	2	3	0	1	152
Shreveport	0	2	1	1	0	0	0	0	0	1	42
Oklahoma:											
Oklahoma City	1	21	2	16	0	2	0	0	0	0	32
Tulsa	0	10	2	4			1	0		0	
Texas:											
Dallas	2	21	3	1	0	1	0	0	0	19	38
Fort Worth	2	8	4	6	0	0	0	0	0	2	42
Galveston	0	0	1	0	0	0	1	1	1	0	11
Houston	1	2	1	0	0	1	0	0	0	2	53
San Antonio	0	3	0	0	0	8	0	0	0	0	78
MOUNTAIN											
Montana:											
Billings	1	0	0	1	0	0	0	0	0	3	9
Great Falls	2	0	1	3	0	0	0	0	0	0	5
Helena	0	0	0	2	0	1	0	0	0	0	7
Missoula	1	0	0	0	0	0	0	0	0	0	8
Idaho:											
Boise	1	0	0	0	0	0	0	0	0	0	5
Colorado:											
Denver	12	10	1	0	0	6	0	0	0	33	85
Pueblo	1	0	0	0	0	0	0	1	0	1	6
New Mexico:											
Albuquerque	0	0	0	0	0	7	0	0	0	0	13
Utah:											
Salt Lake City	2	2	0	11	0	4	0	1	1	12	35
Nevada:											
Reno	0	1	0	1	0	0	0	0	0	0	6
PACIFIC											
Washington:											
Seattle	8	11	3	1			0	1		6	
Spokane	5	4	5	12			0	0		0	
Tacoma	2	2	3	1	0	0	0	0	0	4	21
Oregon:											
Portland	7	12	7	25	0	2	0	2	0	0	58
California:											
Los Angeles	26	14	7	0	0	51	2	0	0	54	342
Sacramento	1	13	0	0	0	2	0	1	0	5	22
San Francisco	15	36	1	0	0	12	1	10	1	7	161

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	0	0	1	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	26	12	7	2	0	0	1	2	1
Rochester	1	1	0	0	0	0	0	0	0
New Jersey:									
Newark	4	1	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	1	1	1	2	0	0	0	0	0
Pittsburgh	3	1	0	0	0	0	0	0	0

City reports for week ended May 12, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	0	1	0	0	0	0	0	0	0
Cleveland	2	1	0	0	0	0	0	0	0
Columbus	0	1	0	0	0	0	0	0	0
Toledo	5	8	0	0	0	0	0	0	0
Indiana:									
Indianapolis	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago	8	2	0	0	0	0	0	0	0
Michigan:									
Detroit	3	1	1	0	0	0	0	0	0
Wisconsin:									
Milwaukee	7	4	0	0	0	0	0	0	0
Racine	1	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
St. Paul	1	0	0	0	0	0	1	0	0
Missouri:									
Kansas City	10	8	0	0	0	0	0	0	0
St. Louis	7	3	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	1	0	0	0	0	0	0
Nebraska:									
Lincoln	0	0	0	0	0	0	0	1	0
SOUTH ATLANTIC									
District of Columbia:									
Washington	0	0	0	0	0	0	0	2	2
Virginia:									
Richmond	0	0	0	0	0	1	0	0	0
South Carolina:									
Charleston	0	0	0	0	1	1	0	0	0
Georgia:									
Atlanta	0	1	0	0	1	0	0	0	0
Savannah	0	0	0	0	1	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	1	0	0	0	0	0
Nashville	0	0	0	0	1	0	0	0	0
Alabama:									
Birmingham	0	0	1	0	0	0	0	0	0
Mobile	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	2	1	0	0	3	1	0	0	0
Texas:									
Houston	1	1	0	0	0	0	0	0	0
MOUNTAIN									
Colorado:									
Denver	2	0	0	1	0	0	0	0	0
PACIFIC									
Washington:									
Tacoma	1	1	0	0	0	0	0	0	1
California:									
Los Angeles	2	0	0	0	1	1	0	1	0
San Francisco	0	0	0	0	2	2	0	0	0

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended May 12, 1928, compared with those for a like period ended May 14, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, April 8 to May 12, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927
101 cities	144	174	137	179	128	171	133	183	121	174
New England	168	105	131	135	133	95	133	130	113	105
Middle Atlantic	209	271	204	270	172	242	170	272	177	262
East North Central	116	135	116	131	131	137	107	159	109	132
West North Central	101	109	80	141	84	158	78	131	55	135
South Atlantic	82	141	82	135	86	105	88	119	82	115
East South Central	40	86	40	30	45	76	40	76	35	81
West South Central	160	141	124	124	100	178	80	141	98	112
Mountain	133	108	80	188	133	99	80	152	71	99
Pacific	74	115	102	157	56	188	125	116	102	94

MEASLES CASE RATES

101 cities	1,340	766	1,362	788	1,290	638	1,423	696	1,376	608
New England	1,726	223	1,743	295	1,593	323	1,332	276	1,120	246
Middle Atlantic	1,739	172	1,834	145	1,862	201	2,266	212	2,254	207
East North Central	998	885	817	797	728	637	794	564	788	459
West North Central	861	1,314	986	1,552	1,017	1,225	858	1,522	937	982
South Atlantic	2,115	1,311	2,358	1,589	1,767	1,017	2,109	1,577	1,704	1,546
East South Central	1,117	396	1,536	517	1,521	375	1,132	517	1,082	345
West South Central	428	1,005	380	1,249	396	922	392	877	336	567
Mountain	743	2,080	761	1,793	840	1,542	752	1,632	1,141	1,300
Pacific	324	2,207	393	2,196	326	1,526	266	1,601	327	1,259

SCARLET FEVER CASE RATES

101 cities	236	391	264	362	266	339	258	260	253	340
New England	301	423	264	346	329	402	345	393	347	489
Middle Atlantic	273	381	287	328	312	446	263	340	285	474
East North Central	194	265	272	296	261	289	254	268	266	289
West North Central	277	396	258	342	275	332	218	271	242	319
South Atlantic	154	150	170	161	214	191	175	128	167	148
East South Central	234	218	200	167	209	193	304	183	155	152
West South Central	128	50	164	41	108	33	148	58	184	21
Mountain	239	950	212	932	203	950	274	1,004	115	726
Pacific	123	243	151	209	110	198	153	212	204	201

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1928, and 1927 respectively.

Summary of weekly reports from cities, April 8 to May 12, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SMALLPOX CASE RATES

	Week ended—									
	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927
101 cities	20	24	22	33	25	21	14	22	18	21
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	6	0	0	0	0	0	0	0	0	0
East North Central	24	32	31	29	28	33	15	28	20	20
West North Central	49	55	60	40	68	38	31	34	43	26
South Atlantic	11	27	12	65	33	18	14	36	21	38
East South Central	35	96	20	162	70	66	15	56	45	56
West South Central	16	87	8	95	28	25	36	33	8	88
Mountain	150	27	168	54	150	9	106	36	159	9
Pacific	74	26	59	97	43	65	31	73	36	91

TYPHOID FEVER CASE RATES

	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927
101 cities	5	8	6	7	4	8	6	10	8	8
New England	9	9	7	0	5	5	2	2	5	5
Middle Atlantic	5	5	6	7	3	5	4	10	2	5
East North Central	1	1	3	[illegible]	2	6	3	7	3	3
West North Central	8	12	6	4	6	4	2	2	8	2
South Atlantic	4	13	9	11	7	16	18	18	19	9
East South Central	20	35	15	30	5	30	0	15	20	66
West South Central	20	17	20	12	24	12	28	37	16	25
Mountain	0	9	0	27	0	9	0	18	18	9
Pacific	8	18	8	10	0	18	15	3	31	10

INFLUENZA DEATH RATES

	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927
95 cities	30	21	28	18	32	18	32	13	33	13
New England	9	16	7	12	14	7	21	5	16	14
Middle Atlantic	27	21	26	20	34	21	28	15	31	14
East North Central	27	11	28	11	35	10	36	7	43	10
West North Central	24	12	41	21	31	12	53	8	43	4
South Atlantic	30	38	16	22	30	29	21	16	9	25
East South Central	84	90	68	58	37	87	84	43	73	32
West South Central	90	42	45	30	37	47	26	13	37	13
Mountain	53	18	53	0	44	9	35	9	27	9
Pacific	14	14	14	10	17	21	7	21	17	7

PNEUMONIA DEATH RATES

	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927
95 cities	207	153	198	159	196	143	206	131	210	123
New England	177	156	166	151	138	184	189	140	257	144
Middle Atlantic	243	175	242	199	246	168	264	166	267	151
East North Central	199	141	192	135	215	128	211	121	232	97
West North Central	175	128	155	124	90	56	128	68	120	70
South Atlantic	209	184	181	179	172	153	184	114	80	128
East South Central	183	138	235	160	178	133	214	149	193	128
West South Central	238	76	197	81	189	123	90	115	164	140
Mountain	186	152	106	161	106	188	159	99	133	54
Pacific	88	117	81	97	125	117	74	79	98	114

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1928 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central	12	10	2,683,500	2,684,500	2,566,400	2,518,500
South Atlantic	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central	7	6	1,048,300	1,028,300	1,000,100	980,700
West South Central	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain	9	9	591,100	581,600	591,100	581,600
Pacific	6	4	2,046,400	1,996,400	1,548,900	1,512,100

FOREIGN AND INSULAR

THE FAR EAST

Reports for the weeks ended April 28 and May 5, 1928.—The following reports for the weeks ended April 28 and May 5, 1928, were transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Week ended April 28, 1928

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Suez.
Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Siam.—Bangkok.

CHOLERA

India.—Bassein, Calcutta, Madras, Moulmein, Rangoon, Tuticorin.
French India.—Pondicherry.
Straits Settlements.—Singapore.
Siam.—Bangkok.
French Indo-China.—Saigon.

SMALLPOX

Iraq.—Basra.
India.—Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon, Tuticorin.
French India.—Pondicherry.
China.—Shanghai, Hong Kong.
Japan.—Osaka, Shimonoseki.
Kwantung.—Dairen.
South Manchuria.—Changchun.
Manchuria.—Mukden.

Returns for the week ended April 28 were not received from the following ports:

Aden Protectorate.—Perim.
Dutch East Indies.—Belawan-Deli, Samarinda, Padang.
Union of Soviet Socialist Republics.—Vladivostok.

Week ended May 5, 1928

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Dutch East Indies.—Surabaya.
China.—Hong Kong.

CHOLERA

India.—Bassein, Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon, Tuticorin.
Siam.—Bangkok.
French Indo-China.—Haiphong, Saigon.

SMALLPOX

India.—Bassein, Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon.
French India.—Pondicherry.
Dutch East Indies.—Banjermasin, Belawan-Deli.
China.—Shanghai, Hong Kong.
Japan.—Osaka, Shimonoseki
Kwantung.—Dairen.
South Manchuria.—Changchun.
Manchuria.—Antung.

Returns for the week ended May 5 were not received from Vladivostok, Union of Soviet Socialist Republics.

ANGOLA

Communicable diseases—February, 1928.—During the month of February, 1928, communicable diseases were reported in Angola as follows:

Disease	Coast district	Land frontier	Interior	Total
Ancylostomiasis	6	43		49
Beriberi	1			1
Bilharzia	21	3	29	53
Chicken pox	3	2	2	7
Dengue			1	1
Diphtheria		1		1
Dysentery	38	12	1	51
Hemoglobin fever	16	4	8	28
Influenza	58	333	13	404
Leprosy	3			3
Malaria	435	267	128	830
Measles	21	6		27
Mumps	2	5	3	10
Pneumonia	31	36		67
Relapsing fever		5		5
Scabies	18	82		100
Smallpox		36		36
Tetanus	4			4
Tuberculosis	31	3	1	36
Trypanosomiasis	77	103	4	184
Venereal diseases	170	150	33	353
Whooping cough	11		2	13
Yaws	211	50	22	283

Population: 4,119,000.

ARABIA

Aden—Plague conditions—Summary of prevalence to April 14, 1928.—Under date of April 16, 1928, it was stated that epidemic plague at Aden showed some abatement in the Crater, but that a new focus had developed in the Maala district, in the vicinity of the wharves. The total number of cases to April 14, 1928, was stated to be 1,387, with 1,006 deaths.

CANADA

Provinces—Communicable diseases—Week ended May 5, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended May 4, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever			1	2				3
Influenza	18			11				29
Smallpox				8	7	12	2	[illegible]
Typhoid fever		2	12	18	1	1	4	38

Quebec—Communicable diseases—Week ended May 12, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended May 12, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	40	Scarlet fever	94
Diphtheria	42	Smallpox	13
German measles	21	Tuberculosis	68
Influenza	5	Typhoid fever	19
Measles	227	Whooping cough	6

Vital statistics—Quebec Province—March, 1928.—Births and deaths in the Province of Quebec for the month of March, 1928, were reported as follows:

Estimated population	2,650,400	Deaths from—Continued.	
Births	6,999	Heart disease	325
Birth rate per 1,000 population	31.2	Influenza	120
Deaths	3,131	Measles	27
Death rate per 1,000 population	13.9	Pneumonia	330
Deaths under 1 year	840	Scarlet fever	12
Infant mortality rate	120.0	Smallpox	1
Deaths from—		Syphilis	6
Cancer	178	Tuberculosis (pulmonary)	203
Cerebrospinal meningitis	12	Tuberculosis (all other causes)	53
Diphtheria	33	Typhoid fever	15
Diabetes	20	Violence	63
Diarrhea	117	Whooping cough	41

ESTONIA

Communicable diseases—March, 1928.—During the month of March, 1928, communicable diseases were reported in the Republic of Estonia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	14	Scarlet fever	420
Diphtheria	40	Tuberculosis	212
Measles	76	Typhoid fever	20

Population 1,114,630.

GREAT BRITAIN

Castleford—Epidemic smallpox.—Under date of April 28, 1928, epidemic smallpox, with 93 cases, was reported at Castleford, England, a manufacturing and mining town of 25,000 inhabitants situated in the vicinity of Leeds. The first case was stated to have occurred February 20, 1928.

HAITI

Meningococcus meningitis.—A report dated May 9, 1928, states that the epidemic of meningococcus meningitis in the northern part of the island of Haiti had subsided. The disease was confined to mountain districts of the Department of the North, and did not reach epidemic proportions in any city or town. The fatality rate was said to be 12½ per cent among the treated cases. On May 5, 1928, 57 cases remained under treatment, all but 5 of which were convalescent.

ITALY

Communicable diseases—February 13–26, 1928.—During the two weeks ended February 26, 1928, communicable diseases were reported in the Kingdom of Italy as follows:

Disease	Feb. 13–19, 1928		Feb. 20–26, 1928	
	Cases	Communes affected	Cases	Communes affected
Anthrax	13	13	21	20
Cerebrospinal meningitis	6	6	5	[illegible]
Chicken pox	336	126	370	[illegible]
Diphtheria	496	271	439	[illegible]
Dysentery	1	1	1	1
Lethargic encephalitis	6	7	9	9
Measles	2, 339	350	2, 896	[illegible]
Poliomyelitis	9	9	6	6
Scarlet fever	397	170	327	187
Smallpox	2	2	2	[illegible]
Typhoid fever	395	211	321	178

LATVIA

Communicable diseases—March, 1928.—During the month of March, 1928, communicable diseases were reported in the Republic of Latvia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	15	Puerperal fever	[illegible]
Diphtheria	63	Scabies	[illegible]
Erysipelas	18	Scarlet fever	237
Influenza	49	Tetanus	2
Leprosy	2	Trachoma	40
Malaria	1	Typhoid fever	[illegible]
Measles	822	Typhus fever	[illegible]
Mumps	22	Whooping cough	[illegible]

Population, estimated: 1,950.

UNION OF SOUTH AFRICA

Cape Province—Typhus fever—Week ended April 7, 1928.—During the week ended April 7, 1928, fresh outbreaks of typhus fever were reported in the Glen Gray and Xalanga districts, Cape Province, Union of South Africa.

URUGUAY

Montevideo—Communicable diseases—January, 1928.—During the month of January, 1928, communicable diseases were reported at Montevideo, Uruguay, as follows:

Disease	Cases	Disease	Cases
Diphtheria	34	Scarlet fever	21
Leprosy	1	Tuberculosis	159
Measles	[illegible]	Typhoid fever	10

Population: [illegible].

Mortality from communicable diseases.—During the period under report 7 deaths from measles, 1 death from scarlet fever, and 104 deaths from tuberculosis were reported at Montevideo.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C, indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928: 18	Feb. 25	March, 1928: 3	Mar. 10	Mar. 17	Mar. 24	Mar. 31	April, 1928: 7	Apr. 14	Apr. 21	Apr. 28	May 5, 1928
China:																				
Amoy	C	28	72	16																
	D	7	3																	
Canton	C	31	36	14	12	1								1	1					
	D	16	25	14	11	1								1	1					
Foochow	C	P	P	P																
Hong Kong	C	P	1	P																
Shanghai (settlement and concession)—																				
Foreigners only	C	1	6	3																
Including natives	D	28	74	7																
Swatow	C	42	P	P	P															
	D		P	P	P															
Tientsin	C	P	15	2	P	1														
Dutch East Indies: Java—Batavia	C				28	3														
	D				18	3														
India	C	45,163	31,390	20,160	23,047	25,139	15,377	12,391	2,865	3,047	3,256	4,068	4,546	5,384						
	D	22,051	15,895	10,371	12,863	15,026	8,863	6,750	1,529	1,686	1,755	2,312	2,606	2,931						
Bassein	D							1		1	1			4	25	22	20	6	6	9
Bombay	C	42	3		2			1				1	1	1	1					
	D	30	2		2							1	1		1	1				
Calcutta	C	87	76	101	199	428	176	203		80	99	162	164	190	148	162	163			
	D	40	39	64	138	281	125	112	35	42	63	101	94	122	114	112	111	97	108	115
Madras	C	547	59	14	13	1	1	2		3	11			7	1	2	5	5		5
	D	278	48	8	7	2	1	4	2	2	7	7		2	1	1	4	5	4	
Madras Presidency	C	7,660	3,056	2,050	3,073	3,702	1,864	4,681	930	839	621	571	510	455						
	D	3,513	1,581	1,055	1,736	2,104	984	2,660	504	457	357	300	280	244						
Negapatam	C							4												
	D							6	2	2							1			1
Rangoon	C	1	2	6	2	8	4	6	10	12	3	4	4	7	8	8	5			
	D	1	2	5	5	6	3	2	8	4	3	4	2	8	6	4	2	7	6	1
Tuticorin	C			1		8										16	43	45	19	3
	D			1	37	14							1			8	26	32	10	3

India (French):																				
Chandernagor	C	1	1		6	10	14	6	2	2		1	2	1						
	D	1			6	10	9	1	2	2		1	1	1						
Karikal	C	18	1		1	1	8	32	2	2	2									
	D	12	1		1	1	4	19	2	1	2									
Pondicherry	C	12	15		1	25	11	12	17	10	6					1	2	3	2	1
	D	11	15		1	21	12	10	12	4	3					1	2	3	2	1
Indo-China (see also table below):																				
Saigon	C		1	1			3	4	1	5	2	8	27	13	21	35	50	28	23	15
	D						1	1	1	1		6	19	8	12	20	37	17	12	10
Iraq [1]																				
Kwangchow-Wan (see table below)																				
Philippine Islands: Manila	C	1																		
Siam	C	77	40	18	110	88	110	200	74	59	84	78	53	88	70	80	24			
	D	53	24	11	76	64	80	139	50	38	73	53	39	67	54	58	17			
Bangkok	C	2	3	5	4	3	21	101	23	17	12	8	8	12	16	24		30	24	20
	D	1	1	3	2	2	11	66	12	11	7	6	5	5	12	11		13	14	8
Straits Settlements: Singapore	C				7	5	23	3					1	1					1	
	D				5	4	12	1					1	1					1	
On vessel:																				
S. S. Adrastus: At Yokohama, Japan	C	1																		
	D	1																		
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C															P				
S. S. Tabaristan: At Basra, Iraq	C			1																

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Duliam Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

Place		July-September, 1927	October, 1927	November, 1927	December, 1927			January, 1928			February, 1928			March, 1928			April	
					1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20
Indo-China (French):																		
Annam	C	3,179	226	126	16	2		79	95	93	23	36	14	18	18	23	17	11
Cambodia	C	251	180	85	21	12	39	30	9	15	38	22	51	33	22	92	43	162
Cochin-China	C	469	178	100	17	38	58	46	119	130	178	113	153	206	217	245	277	316
Laos	C	246	67	10														
Tonkin	C	1,297	1				2	1									1	4
Kwangchow-Wan	C	16																

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb 11, 1928	Week ended— February, 1928: 18	25	March, 1928: 3	10	17	24	31	April, 1928: 7	14	21	28	May, 1928: 5	12	19
Algeria (see also table below):																					
Oran	C	1		2																	
	D	1																			
Arabia: Aden	C					19	178	63	45	77	158	189	148	151	163	108	59	53	13		
	D					7	104	50	31	26	99	134	135	134	126	97	48	16	16		
Argentina:																					
Bahia Blanca district	C				3																
Buenos Aires	C						2														
Cordoba Province	C		P	P	10	2										5				(1)	
Firmat	C				1																
Quilino	C				3																
Rosario	C				4	5	4	1													
Santiago Province	C							1													
Ucacha	C				1																
Azores: St. Michaels Island	C	2	3	3	3	2	8	1	1	1		1	1		1		2				
	D	1	1		1	1	4			1		1			1		1				
Brazil:																					
Bahia	C					4	5	4	4					P	2						
	D					4	4	2	3												
Porto Alegre	C									2											
Rio de Janeiro	C						4	1	1		1	2	1								
	D						1	2				2	1								
British East Africa (see also table below):																					
Tanganyiki	C		P	P	P	P	2			6											
	D						2			3											
Uganda	C	226	99	99	67	79	23	13													
	D	158	88	96	61	64	18	10													
Canary Islands:																					
Las Palmas	C		9		3	3	1	1				2		2							
	D				1	1	1	1													
Teneriffe	C						10														
	D						4														
Ceylon: Colombo	C	3	1		6	7	3	3	3	4	1	3		4							
	D	3			6	6	2	1	3	1	1	3		2							
China:																					
Hong Kong	C																		1		
Tungliao	D		95																		

Dutch East Indies:																					
Balik-Papan	C					1															
	D					1															
Celebes—Makassar	C			6	2	6	5		1												
	D			6	2	5	5		1												
Java	D	432	779	829	1,017	754	737	178	149	127											
Batavia and West Java	C	68	130	132	154	128	137	31	15	24	33	19	18	17	26						
	D	68	129	132	152	128	135	31	15	24	33	19	18	17	26						
Cheribon	C				1																
	D				1																
East Java and Madura	C	18	17	10	8	7	7			1		1	1	2							
	D	18	17	10	8	7	7			1		1	1	2							
Pasoeroean Residency	C				P																
Surabaya Residency	C				P									1					1		
	D													1					1		
Surakarta Residency	C			P	P																
Ecuador: Guayaquil (see table below)																					
Egypt:																					
Alexandria	C	1			12	5	2	1													
	D				7	2	2	1													
Beni-Souef	C																	4		4	
	D																	1		4	
Cairo	C					2															
	D					2															
Maghagha District	C																1				
	D																1				
Minieh Province	C																32	9		13	
	D																5	4		5	
Suez	C	1				1	4	3	4	3	3		4	7	3		3	2			
	D					1	2	3	3	2	1		2	3	4		2	2			
Tanta	C																				1
	D																				1
Greece:																					
Athens and Piræus	C	3	1			3															
	D		1			1															
Mitylene	C	5	1	3	3																
Patras	C	2	1	1																	
	D		1	1																	
Hawaii Territory: Hawaii	D							1													
India	C	2,710	3,246	3,600	5,518	7,097	12,652	5,188	5,776	6,136	6,074	7,517	6,077								
	D	1,428	1,792	2,065	3,269	4,925	8,521	3,585	3,909	4,825	4,586	6,031	4,724								
Bassein	D	14	8	4	4	17	8	1	2	4	5	5	5	7	5	4	5	1	3		
Bombay	C	7	4			3	14	5	14	7	7	4	16	28	21	17					
	D	5	3			3	9	6	14	7	6	4	11	25	21	15	14	19	21		
Calcutta	C	18				2															
	D	10					1									2					
Madras Presidency	C	465	583	470	791	550	452	142	112	64	53	25	19								
	D	230	298	282	359	206	256	79	72	34	27	18	16								
Rangoon	C	6	11	11	15	17	35	15	16	6	11	5	11	3	11	5	2				
	D	6	11	11	15	16	30	12	15	6	10	4	9	5	8	5	1	3	5		

[1] Six cases of plague reported in Buenos Aires, Argentina, before May 14, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C, indicates cases; D, deaths; P, present]

Place		Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928 18	February, 1928 25	March, 1928 3	March, 1928 10	March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14	April, 1928 21	April, 1928 28	May, 1928 5	May, 1928 12	May, 1928 19
Indo-China (see also table below):																					
Saigon	C	2		1																	
Iraq:																					
Baghdad	C						4		1	1		2	2	1		1	4			2	
	D						2		1	1		2	2	1		1				1	
Dulaim Liwa	C						1									1					
Kwangchow-Wan (see table below).																					
Madagascar (see table below)																					
Mauritius (see table below)																					
Nigeria (see also table below):																					
Lagos	C			17	13	10	10	2	3	2	1	2		2	3	2		7			
	D			17	13	8	11	2	3	2	1	2		2	3	1		7			
Peru (see table below)																					
Senegal:[1]																					
Baol	C	72	95	P	P																
	D	33	40																		
Cayor	C	463	176	48																	
	D	233	88	28																	
Dakar	C	20	1																		
	D	12																			
Louga	C	5	8																		
	D	4																			
Rufisque	C	16																			
	D	12																			
Thies and vicinity	C	9	1	1										8							
	D	7												4							
Siam	C		13	1	3	16	20	13	4	11	14	7	8	13	5		11				
	D		9		2	11	12	10	4	10	12	6	9	10	5						
Bangkok	C		2			1	2	1						1			3	1			
	D			1		1	2	1						1			2				
Straits Settlements: Singapore	C			1			1	1	1		1		1								
	D			1			1	1	1				1								
Syria (see table below)																					
Tunisia[2]																					

Turkey: Constantinople	C	1	1		2																
	D		1		1																
Union of South Africa:																					
Cape Province	C			2	2		1														
	D			2	1		1														
Orange Free State	C			1	8		5	4	1			3	2								
	D			1	6		4	1				3	2								
Union of Soviet Socialist Republics:																					
Chita district	C		1																		
	D		1																		
Northern Caucasus	C	14	1																		
	D	10																			
Venezuela: State of Miranda—Tacata and Cua	C										P										
On vessel:																					
S. S. Cadwallen at La Plata, from Rosario, Argentina	C					1															
S. S. Aghios Gerasimos, at Vigo, Spain	C			3																	

[1] During January, 1928, 5 cases of plague were reported in interior of Senegal; 17 cases with 13 deaths during last 2 weeks in February; 8 cases and 4 deaths, Mar. 11 to 20, 1928.
[2] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928
Algeria: Algiers [1]	C		2					1
Angola	C		3					
British East Africa: Kenya	C	95	62	26	24	19		
Ecuador: Guayaquil	C	15	18	4	6	10		
	D		5	4	3	1		
Indo-China (French)	C	14	10	7		5	6	
Kwangchow-Wan	C					18	3	
Madagascar	C	314	692	427	342			
	D	286	605	388	317			
Ambositra Province	C	7	25	105	67			
	D	7	17	96	66			
Antsirabe Province	C	39	109	117	108			
	D	38	108	117	108			
Itasy Province	C	36	104	33	19			
	D	41	94	29	17			

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928
Madagascar—Continued.								
Moramanga Province	C	12	95	19	25			
	D	12	83	19	24			
Tananarive Province	C	211	408	155	123			
	D	189	354	129	102			
Mauritius	C	1						
Nigeria	C	32	63	16	16			
	D	29	61	16	16			
Peru	C	34	34		41			
	D	19	11		14			
Callao	D	3	3					
Lima	C		7	6				
	D		3					
Senegal	C			5	17	8	81	
	D				13	4	40	
Syria: Beirut	C		2					

[1] 1 case of plague at Algiers May 2, 1928.

PLAGUE RATS ON VESSELS

S. S. *Modemi* at Goteborg, Sweden, from Bahia and Buenos Aires via Cape Verde Islands, December 22, 1927.
S. S. *Gydavore* at Landskrona, Sweden, from Rosario via Canary Islands, January 22, 1928.
S. S. *Dryden* at Liverpool from La Plata River ports, January 20, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928		March, 1928					April, 1928				May, 1928	
									18	25	3	10	17	24	31	7	14	21	28	5	12
Algeria (see also table below)	C	459	382	683	661	170	129	71	30		28	14	3				12				
Algiers	C					3	9	15	4		5	1		2	2	1		2			
Oran	C	9	16	11	20	39	29	11	1		2	2		2	10		3	1	2		
Angola (see table below):																					
Arabia: Aden	C				1	3	1		1												
Brazil (see also table below):																					
Para	C	1																			
Rio de Janeiro	C	6	10		1								1								
	D	4	9		1								1								
British East Africa (see also table below):																					
Kenya—Mombasa	C													1							
Tanganyika	D	21	8	P	P	P	8	5													
British South Africa:																					
Northern Rhodesia	C	55	39	164	185	252	236	233	79	117	38	63		54	8	5					
	D	1	2	11	64	62	31	23	5	32	2	3		9							
Southern Rhodesia	C				3	2	1	3	2	4	P	3	4	1	2		21				
	D									1							10				
Canada:																					
Alberta	C	17	17	23	10	10	11	27		3		7	7	20	7	13	4	2	3	3	
Calgary	C	1											1								
Edmonton	C			1	1	8	5	3	1		11	1	1	11	1	7	2			1	12
British Columbia: Vancouver	C		2			4	8	26	2	1	3	4	2	5	6	4	11				
Manitoba	C	13	9	7	19	7	11	1												7	
Winnipeg	C	5	4	2	2	2	2	2													
New Brunswick	C						1			1											
Nova Scotia:																					
Halifax	C		1	1																	
Ontario	C	60	22	96	264	347	212	243	40	51	36	20	19	35	20	9	6	18	18	8	
Hamilton	C					2															
Kingston	C				1		1	1									2		1		
Ottawa	C	27	40	67	134	63	60	68	11	3	1	7	6	8	10	2		3	1		4
Toronto	C		2	10	34	39	28	20	4	4	2	4	2	3	3	1	2	4	4	1	2
Windsor	C			9																	

[illegible]	C	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Montreal	C				1		8	8	5	1	3		6	3				6	2	1	
Quebec	C					4	5	5		2	5	4	3	4	4	5	4			9	
Riviere du Loup	C				3																
Sherbrooke	C														3						
Saskatchewan	C	14	68	31	34	58	52	97	7	8		7	14	7		12	2	23	15	10	
Moose Jaw	C	10	16	3		1	4	11		2	6	5	2	5			3				
Regina	C	8		5	1	1									1	2	3	2		3	1
Saskatoon	C					2	4	15		2											
Ceylon: Colombo	C	1			1	2		4	2	1	3					1					
	D	1				1		1						1							
China:																					
Amoy	C											1	1	2	1						
Antung	C						1											1		2	
Canton	C		1									2	3	2		2	1				
	D		1																		
Chefoo	C		1	P		P							P								
	D		1								1										
Foochow	C	P	P	P	P	P	P	P		P		P									
Hong Kong	C	1	2				1	2	1	3		3	5	7	10	10	4	4	9	8	
	D	1	2				1	2		1	1	2		2	5	12	7	2	10	7	
Manchuria—																					
Changchun	C					1		4									2		1	1	
Dairen	C			1	2	1	5	15	3	4	6		1	3	5	6	7	3	6		
	D			1				8	4	2	1			3	5						
Fushun	C		1		1																
Harbin	C					2	1	5	2	1	3	1	2	3		2	2				
Mukden	C			2	1			4	18		3				1			3	1		
Pensihu	C			1																	
Shanghai—																					
Foreigners only	C							5	1	1	1	3	1	1	3	2		1			
Including natives	D							11	5	4	4	6	2	1	3	3	3	1	3	2	
Tientsin	C		4	13	8	9	8	48	5	2	2	11	4	3	3	3					
Chosen (see table below)																					
Curacao (alastrim)	C							2	3												
Dominican Republic: Santo Domingo	C												2							1	
Dutch East Indies:																					
Borneo—																					
Pontianak	C									1											
Samarinda district	C				P																
South and East Borneo Residency	C	P																			
Java—																					
Batavia and West Java	C	4		4	25			4		1		1	4			1					
	D				15																
East Java and Madura	C	4	22	8	9	9	5	2			8	1									
	D			1								1									
Sumatra—Medan	C					3	9	23	7	3	1	3	6			1	2				
	D					2	3	11				2	4			1	2				
Ecuador (see table below)																					
Egypt	C		3			4	4	1		1	1					52	11				
	D		1	1		1										33	6				
Cairo	C					2		1													

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928: 18	25	March, 1928: 3	10	17	24	31	April, 1928: 7	14	21	28	May, 1928: 5	12
France (see table below)																					
Gold Coast (see table below)																					
Great Britain:																					
England and Wales	C	568	508	473	902	1,041	1,175	1,530	369	392	385	347	359	342	322	318	321	326	376	321	
Birmingham	C	1		1				44	1		2		1				1				
Bradford	C				11	19	32	24	7	1		4	9		5	5	3	2	7	2	
Bristol	C			6	4	8		3			1	3		2	8	2	1	10	1	5	
Cardiff	C				1		1								5				1	2	
Castleford	C									1	1	2	2	18	7	11	27	11	20	11	
Leeds	C	5	3	7	5	16	11	3	1	2	4	2	3	5	3	3	2	2	1		
Liverpool	C						1					1									
London	C							4	10	1	2	1	10	5	1	1	7	5	3	27	
Manchester	C			3	6	25	5	25	1	4	1	2	4	3	3	4	2	4	2		
Newcastle on Tyne	C	1	2	6	9	55	22	27	4	1	4	3	3	4		2			4		
Nottingham	C						13	27	6	1	3	1	5	1	6	1	4	4	6	3	
Sheffield	C	2	1	10	6	9	14	8	1	2	2	1				1		10	2	2	
Stoke on Trent	C	1					4	1	2	4	3	6	11			1	4	10	5	13	
Greece:[1] Saloniki	D	2																			
India	C	5,911	4,398	3,153	4,052	6,731	10,676	17,777	4,567	4,220	5,251	4,812	6,004	6,169							
	D	1,668	1,120	715	927	1,650	2,429	3,709	1,073	938	949	866	1,212	1,207							
Bassein	C	1						1													1
	D	1																			
Bombay	C	33	12	10	4	9	14	61	29	23	46	51	49	58	62	49	56	57	54	33	
	D	19	8	2	3	2		24	15	13	23	22	24	33	36	27	32	34	27	25	
Calcutta	C	27	22	5	5	25	36	58	9	18	14	30	20	29	45	40	49	51	31	40	41
	D	25		6	2	11	27	34	5	11	10	24	15	21	33	35	32	42	21	35	30
Karachi	C											1	1								
	D											1									
Madras	C	6	7	8	7	11	21	74	15	33	21	81	30	27	45	81	49	36	60	24	
	D		2		2	3	6	8	3	3	3	10	5	3	6	15	16	8	7	7	
Negapatam	C	3	1				5	8	1		1	1					1		5	1	
	D	2	1				3	3									1		2		
Rangoon	C	14	9	17	6	14	136	275	68	82	132	96	96	82	92	50	62	45	37	23	
	D	3	2	3	1	4	31	64	22	24	26	32	28	17	34	23	24	17	12	16	
Vizagapatam	C		3				3	10		1		1			3			2			
	D		2					8													

India (French):																					
Karikal	C	3	1	2	P																
	D	3	1	2																	
Pondicherry	C	39	37	38	42	41	65	47			6	3		6	5	7	12		15	9	
	D	31	37	38	42	41	50	47			6	3		6	5	7	12		15	9	
Indo-China (see also table below):																					
Saigon	C	1	1			1	3			2		1									
Iraq:																					
Baghdad	C		1	7	5	25	23	19	2		3	2	3	1		1	1				
	D		1	4	4	14	12	11	1		1	2	3	1			1				
Basra	C	1	4	2	3	4	2	1	1		2	4	4	1					1		
	D	1	4	2	1	3	1						1	1					1		
Italy:																					
Leghorn	C										1		1								
Palermo	C														3	2	1	3	3		
Rome and vicinity	C		1					3													
Jamaica (outside Kingston) (alastrim)	C	6	9	9	7	3	2	5	1	3		6	3	2	1	7		1	2		
Kingston (alastrim)	C		3	2																	
Japan:																					
Kobe [1]	C																				
Nagasaki	C	2																			
	D	1																			
Tokyo	C							4		1		3	1	3	1	10					
	D							1			1	1				1					
Tokyo Prefecture	C													17	5	2	1				
	D															1	1				
Latvia (see table below)																					
Mauretania	C								P	P											
Mexico (see also table below):																					
Acapulco	C		2		1																
	D		2		1																
Chihuahua	D						1														
Jalisco (State)	C										P	P	P	P	P	P	P	P	P		
Guadalajara	D					2					1					2	2	1	4	5	7
Manzanillo	D						1						1								
Mexico City and surrounding territory	C					4		2	2												
Saltillo	D																				1
San Luis Potosi	D	1																			
Tampico	C									1											
Torreon	D	1		2																	
Morocco (see table below).																					
Nigeria (see also table below):																					
Lagos	C															1					
Southern Provinces	C										7			40	26	27					
	D													28	1	6					
Palestine: Jerusalem	C					1		1													
	D							1													
Persia (see table below).																					
Poland	C	2				1	6	3	1				1								
	D	1																			

[1] 6 cases of smallpox at Kobe, Japan, week ended May 19, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928 18	25	March, 1928 3	10	17	24	31	April, 1928 7	14	21	28	May, 1928 5	12
Portugal (see also table below):																					
Lisbon	C		3	8	4	10	12	12	3	9	4	4			2	3		3			
	D					1						1									
Oporto	C		1														1				
Senegal: Dakar	C									8		26	17			12	5				
	D												12			8					
Siam	C	51	27	6	1	9	23	35	1	7	1	3		2	14	12					
	D	10	15			1	2	4	1	1		1			4						
Bangkok	C		3		1	1	3														
	D		1				1														
Sudan (Anglo-Egyptian)	C						4	85	13	27	56	13	10	28	250	54	29	18			
	D						4	42	2	7	13	5	7	8	75	10	6	8			
Spain (see also table below):																					
Malaga	D				1	1															
Seville	C						1														
Valencia	C			1			2					1		1	1						
Straits Settlements: Singapore	C				1			1	1				1					1			
Switzerland	C						2														
Syria (see table below)																					
Tunisia: Tunis	C						4	3	2	4	2	6	1		1	2					
Union of South Africa:																					
Cape Province	C	P		P				P													
Natal	C							P	P			P	P								
Orange Free State	C	P			P	P	P	P													
Transvaal	C			P	7																
Upper Volta	C								2	3				2			P				
Union of Soviet Socialist Republics (see table below)																					
Venezuela:																					
Maracaibo	D		2	1				1				1									
On vessel:																					
S. S. Arendskerk at Singapore, from Amoy, China	C														P						

S. S. Tjileboet at Hong Kong, from Shanghai	C																	P
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C														1			

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927	December, 1927	January, 1928			February, 1928			March, 1928			April, 1928	
								1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20
Algeria	C	376	459	382	682													
Oran	C	14	10	16	11													
Indo-China (French)	C	19	3	21	25	38	34		40	18	50	31	90	57	71	69		35
Senegal	C																	51
	D																	7
Sudan (French)	C									4		5	1	P	5			4
Syria:																		
Aleppo	C						1		1									
Beirut	C						2			15	11	26		12	7	4	3	5
	D															2	1	
Damascus	C		3	5	22	13	12	11	2						1			

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Angola	C	51	73	71	7	10	36	
	D		2					
Congo	C	5	77				36	
Cuanza-Norte	C	1						
Cuanza-Sul	C		2		7	10		
Loanda	C	1						
Zaire	C	3	4	1				
Brazil: Porto Alegre	C	11	4	1			1	
British East Africa: Zanzibar	C		2					
	D		1					
Chosen	C	21	2	2		4	21	
	D	6		1		2	8	
Ecuador: Guayaquil	C	4	1	1	4	2	9	24
	D							1
France	C	37	7	4	14	11	10	13
Gold Coast	C	7	4				1	3
Greece	C	10	4		5	6	11	19
	D						2	2

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Latvia	C		2				1	
Mexico	D	221	132	157	157			
Morocco	C	150	81	140	401	55	47	30
Nigeria	C	820	223	93		275	317	
	D	173	51	30		39	45	
Persia	D			2		7		
Portugal	C					143	215	
	D					22	8	
Spain: Madrid	D			1				
U. S. S. R.:								
Railways, etc	C	26	7	11	15	18		
Other territories in Europe	C	366	220	471	565			
Transcaucasus, Siberia, and Central Asia	C	80	40	21	20			
Ukraine	C	27	11	20	17	6		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928: 18	February, 1928: 25	March, 1928: 3	March, 1928: 10	March, 1928: 17	March, 1928: 24	March, 1928: 31	April, 1928: 7	April, 1928: 14	April, 1928: 21	April, 1928: 28	May 5, 1928
Algeria:																				
Algiers	C							1			1	2	1	1	2	5	1	3		
	D										1							2		
Oran	C						4	2	2	1	6	1	1		2	1	1	6		3
	D																	1		
Argentina (see table below)																				
Austria: Vienna	C							1												
Bulgaria (see also table below):																				
Sofia	C			17	6	1	6	1					3		3	14				
	D				1															
Chile:																				
Antofagasta	D			1																
Talcahuano	D		1											1						
Valparaiso	C		1		1	2	1				1									
	D	2	1		2															
China (see also table below):																				
Manchuria—																				
Dairen	C																7		3	
Harbin	C	2			1															
Tientsin	C		2																	
Chosen (see table below)																				
Czechoslovakia (see table below)																				
Egypt	C	2		12	4	14	8	9		13	3	1		1	1		2	1		
	D	3		5		8	4	2		5	3			1						
Cairo	C					3										2				
	D					3										1				
Port Said	C			1		1														
Behera Province	C															29				
Gharbieh Province	C															23				
Keneh Province	C															5				
Greece (see table below)																				
Ireland (Irish Free State)	C							1									1			
Cork County	C					3	1													
Donegal County, Letterkenny	C			4																

Japan (see table below)																				
Latvia (see table below)																				
Lithuania (see table below)																				
Mexico:																				
Guadalajara	D					1														
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	15	5	1		4	3	6	6			4		2	
	D				2	1	5				3	1		3					1	
Monterey	D													1						
Morocco (see also table below)	C						342	1,051	141			175	172	167	219	190	186	167	136	
Palestine	C	11	1	5	3	9	8	5	1	2	6	1	5			2	3			2
Peru (see table below)																				
Poland	C	50	35	19	64	93	195	346	57	62	57	89	90	90	125	77	93			
	D	6	2	4	11	10	16	19	10	3	7	6	5	6	7	7	8			
Portugal (see also table below): Oporto	C	1			1			1												
Rumania	C	36	16	17	22	35	68	39		14	26	28	29	34	33	45	36			
	D	1		2			3	9			4	1	2	2	3	4				
Syria (See also table below): Aleppo	C		2				2													
Tunisia	C	14		3	1	1	6	4	1				13		5			2	16	
Union of South Africa:																				
Cape Province	C	P	P	P	P	P	1	1	P	P				P	P	P				
Natal	C	P	P	P	P	2	3	1	P	P		2	P	P	P					
Orange Free State	C			P		P		P	P	P				P	P					
Transvaal	C	1		5	P	P								P	P					
Union of Soviet Socialist Republics (see table below)																				
Yugoslavia (see table below)																				
On vessel: S. S. Gaika at Durban, Natal—from Mauritius	C										1									

Place		1927				November, 1927			December, 1927			January, 1928			February, 1928		
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Algeria	C	67	33	10	12												
	D	13			1												
Algiers	C	2	2	6	2												
Bulgaria	C	12	24	7	2						2	7	6		8	12	6
	D		1	2	1						1		1		1	2	2
Morocco	C	148	76	7	11	5	14	7	5	6	75						

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Argentina: Rosario	C			1				
	D				1	1		
China: Shanghai	D			1				
Chosen	C	90	16	26	38	183	400	
	D	8	1	2	3	19	44	
Chemulpo	C	3				1		
Gensan	C	2				1		
	D					1		
Seoul	C	5	2					
	D	1	1					
Czechoslovakia	C	12	1		6			25
Greece: Athens	C	3			1	2	2	
Japan	C	1		1				
Latvia	C	6					1	26
Lithuania	C	69	9	18	27	86	137	
	D	14	1	1	1	10	12	

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Mexico	D	64	36	29	33			
Peru:								
Arequipa	D	3	2		1	2		
La Oroya	C					P	P	P
Lima	C	8						
Turkey	C						17	
	D						1	
U. S. S. R.:								
Railways, etc.	C	77	23	33	46	41		
Transcaucasus, Siberia, and Central Asia	C	208	61	49	80	7		
Ukraine	C	295	151	198	282	533		
Other territories in Europe	C	1,839	521		1,403			
Yugoslavia	C	20	1	1		7	24	3
	D	5				3		

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
Belgian Congo:																				
Boma	C											3								
	D											2								
Matadi	C											6	12	11	1	5	8			1
	D											2	6	8	2	5	6			

Dahomey:																				
Grand Popo	C						1													
	D						1													
Porto Novo	C	1																		
	D	1																		
Gold Coast (see also table below):																				
Ashanti—																				
Obuasi	C		1																	
	D		1																	
Ivory Coast	C	1									1									
	D	1									1									
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	38														
	D	3	9	21	31	28														
Dakar	C	1			12	14	2	1	4			1	1							
	D				7	10	2	1	4			1	1							
Togoland	C		1																	
	D		1																	

Place		July	August	September	October	November	December	January	February	March	April	May
Gold Coast	C	15	2	6	1							(1)
	D	4	2	4	1							

[1] 1 case of yellow fever at Accra; probably laboratory infection.

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TREASURY DEPARTMENT

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SPECIAL ARTICLE

The Blacktongue-Preventive Action of 16 Foodstuffs, with Reference to Identity of Blacktongue and Pellagra

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1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R. C. WILLIAMS, *Chief of Division*

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PUBLIC HEALTH REPORTS

VOL. 43 JUNE 8, 1928 NO. 23

A STUDY OF THE BLACKTONGUE-PREVENTIVE ACTION OF 16 FOODSTUFFS, WITH SPECIAL REFERENCE TO THE IDENTITY OF BLACKTONGUE OF DOGS AND PELLAGRA OF MAN

By JOSEPH GOLDBERGER and G. A. WHEELER, *Surgeons*, and R. D. LILLIE and L. M. ROGERS, *Passed Assistant Surgeons, United States Public Health Service*

CONTENTS

Some of the results of our study of the problem of an experimental animal for pellagra were briefly summarized in a communication published two years ago (1), and have been presented in detail in two recent publications. In the first of these Goldberger and Wheeler (2) reported the production in the dog, by feeding pellagra-producing diets, of a pathological condition considered by them to be identical with the spontaneously occurring canine disease known to American veterinarians as blacktongue.[1] The clinical resemblance of this canine disease to pellagra in man was discussed and was considered so striking as to be, in itself, practically conclusive of the identity of these two conditions. In harmony with and supporting this view was also the suggestion of a common etiology indicated by the successful production of the canine disease by feeding with pellagra-producing diets. In the second communication, Goldberger, Wheeler, Lillie, and Rogers (3) reported a series of feeding experiments with yeast, from the results of which they concluded that experimental blacktongue is due to a deficiency in diet that is capable of being corrected by something present in abundance in yeast. This demonstration of the presence of the blacktongue preventive in yeast, a substance in which the pellagra preventive (factor P-P) was also known to be present in abundance (4), was considered to increase somewhat the probability that blacktongue and pellagra are fundamentally identical

[1] Synonyms: Stuttgart dog epizootic; typhus der Hunde (dog typhoid); typhus of dogs; gastro-enteritis hemorrhagica; southern canine plague, sore mouth of dogs.

conditions. In this connection it is of interest to note that Denton (5), in a study of the tissue changes in experimental blacktongue, has found that the lesions of the skin, mouth, pharynx, esophagus, and colon in the canine disease are very similar to those in pellagra, and that histologically the lesions in experimental blacktongue duplicate those in pellagra.

In the body of this report reference will be made to differences between certain of the results of our study and those of an apparently similar study by Underhill and Mendel (6). The divergence in our results is of interest, since we have heretofore considered it highly probable that the pathological condition experimentally induced in the dog by Chittenden and Underhill and studied by Underhill and Mendel was identical with the experimental condition studied and identified by us as blacktongue (2). The extensive report of their work (7) which has just come to our attention presents some clinical details which not only seem in themselves significant of a difference in the two pathological conditions, but also suggest that we had heretofore, perhaps, underestimated the significance of certain other clinical differences. Thus we find in this report that a "troublesome skin rash" appears to have been common in the condition with which Underhill and Mendel have worked. We have encountered none such in our dogs. On the other hand, while we have observed a pellagra-like dermatitis of the scrotum in some 40 to 50 per cent of attacks in our male dogs, there is no mention of the occurrence of such an eruption in the condition studied by Underhill and Mendel. Again, in the condition studied by us—namely, blacktongue—there is a definitely marked febrile stage which does not seem to occur in the Chittenden-Underhill syndrome studied by Underhill and Mendel; for they nowhere make mention of it, not even in their full report. These clinical differences seem to us of such importance that, in spite of the striking clinical similarity in certain other respects, doubt now arises as to the identity of the Chittenden-Underhill "pellagra-like" syndrome. Until this doubt is definitely resolved one way or another, it would seem premature to discuss, and we therefore do not attempt to discuss, the differences between the results reported by Underhill and Mendel and those recorded by ourselves in the present and in a preceding communication (3).

In the present communication we present some further results of our study of experimental blacktongue. These results deal with the blacktongue preventive potency of certain selected foodstuffs, 16 in number, with special reference to the relation of experimental blacktongue of dogs to pellagra of man.

METHODS AND CRITERIA

The general methods of caring for and feeding our experimental animals have already been described (2) (3). We may recall, however, that the experimental diets were, as a rule, freshly prepared each day. The daily allowance of food was, in general, intended to be no more than enough for the maintenance of normal body weight. An exception was made in the case of young growing animals, to which more than this allowance was offered. It may be recalled, too, that it has been our practice to use our dogs repeatedly with or without intermediate periods of stock feeding as might be demanded by the purpose of the experiment. In stock feeding, a definite food mixture has been used, principally our diet No. 156, the composition and evidence of the adequacy of which have been given in a preceding communication (2).

In testing for the blacktongue preventive we have employed both the curative and the preventive procedure, singly or in combination. Since, as we have in a preceding communication (2), already indicated the clinical course of experimental blacktongue, especially in the invasional stage, may normally be of an intermittent or relapsing character, we attach no significance to a seemingly favorable therapeutic result in cases in which the treatment is begun early unless confirmed by the results of a preventive test. On the other hand, consistently unfavorable results of treatment under such favoring circumstances have been considered trustworthy indications of a poverty in or lack of the blacktongue preventive, provided that the test dose has been a liberal one. Our experience with experimental blacktongue has led us to consider the rise in temperature which occurs in the advanced stage of the disease as a mark of gravity (2). Only very exceptionally does the attack normally remit after this temperature rise has taken place. We have, therefore, been disposed to consider clinical recovery from the attack (that is, disappearance of all manifestations of the disease with recovery of appetite) following treatment begun at this advanced grave stage as significant, but have, nevertheless, always required confirmation by the preventive test before drawing final conclusions with respect to the presence of the preventive in the substance thus found to be active. Isolated cases of the apparent failure of treatment under these unfavorable circumstances have been considered as without significance.

In testing the individual foodstuffs, one, or exceptionally both, of two types of test diet have been employed. In the first the components other than the foodstuff under investigation are believed to have contributed none or but an insignificant amount of the blacktongue preventive; in the second, some, at least, of the basic components may have contributed or probably did contribute a substantial quota of the preventive. This difference in character of

basic diet should be kept in mind in evaluating and comparing the indications of preventive potency, since the results yielded by the former may probably be considered as due virtually entirely to the action of the foodstuff tested, whereas those of the latter must be considered as a summation effect due to the combined action of the basic components and of the test foodstuff.

So far as our data permit, an appraisal has been made of the blacktongue preventive potency of each foodstuff. In view of the lack of a better practicable standard for such purpose, our appraisal is simply a judgment, in broad terms, of the preventive adequacy of such a quantity as, according to conventional practice, represents the daily allowance for an average adult human male.

The experimental disease in the dog and its diagnosis have been described in a preceding report (2); we need recall only that the earliest distinctive buccal signs are a vivid red injection of the mucosa of the floor of the mouth or a peculiar reddening of the mucosa of the upper lip in the form of bilaterally symmetrical patches, or of both. We have considered the first appearance of these mouth lesions as marking the beginning of the attack of blacktongue. We have conformed to this rule in all cases, even in those relatively few instances in which the pellagralike dermatitis of the scrotum appeared in advance of the mouth lesions. Thus marked, the beginning of the experimental disease, when this is induced by feeding our basic diet No. 123 (or certain of its modifications, namely diets No. 209, No. 195, and No. 268), is only very exceptionally delayed beyond about 60 days after the beginning of the feeding (2). We have therefore been inclined to consider a very notable prolongation of this period, particularly when manifested in more than one of a group of test animals, as significant of the presence in the test diet of the blacktongue preventive in an amount that is somewhat larger than that presumably contained in our standard basic diet.[1] Since other factors, not yet understood, such, for instance, as self-imposed starvation or semistarvation and other possibly coexisting deficiencies or maladjustments of dietary essentials, may and probably do influence the duration of what for convenience may be designated as the deprivation period, we have tried to exercise due caution in the interpretation of such indications.

[1] Our basic experimental diets of the type exemplified by our diet No. 123 (Table 1) contain, we judge, a small amount of the blacktongue preventive derived from its natural-food components, principally corn meal and cowpeas. We have the impression that the "synthetic" type of diet of purified foodstuffs which, presumably, is entirely free of the blacktongue preventive, is not as satisfactory an experimental diet, principally because of a more unfavorable effect on appetite leading to earlier and more marked self-imposed starvation or semistarvation.

MAIZE

The idea that the maize in the diet is in some way concerned in the causation of pellagra has, as is well known, been entertained by students of that disease almost from the time of its first recognition. It seems to have arisen in part, at least, because maize constituted a very large part of the diet of the populations among whom, in the Old World, the disease was endemic. In the United States, maize also is a conspicuous element in the diet of the population in the area where the disease is most prevalent. Both in the Old and in the New World, therefore, maize is more or less prominently associated with the occurrence of pellagra. While the extreme position of certain zeists that there is no pellagra without maize is now no longer tenable, the association is no doubt very common. One is justified in concluding, therefore, that maize is very poor in or lacks the pellagra preventive.

In constructing our experimental diets, based as they are on diets found in association with the occurrence of pellagra, maize was from the first included as a conspicuous element. The basic diet most frequently used by us for the experimental production of blacktongue (diet No. 123, shown in Table 1) contains 400 grams of maize meal per 2,400 calorie ration. This is a large amount of cereal, constituting as it does two-thirds of the weight of the dry ingredients of the diet. Notwithstanding this, however, as has in a preceding communication (3) already been set forth, dogs fed this diet (including certain of its modifications) have developed blacktongue within a period which only exceptionally exceeded a duration of about 60 days. This would indicate that, as measured by the requirements of the dog, maize contains little if any of the blacktongue preventive. Incidentally, it may be noted that cornstarch would also appear to be very poor or lacking in the blacktongue preventive since, as previously reported (3), two dogs fed a diet (No. 281) containing 366 grams of cornstarch per 2,400-calorie portion promptly developed the disease.

The maize meal used in our basic diet No. 123 (including its modifications) does not, however, represent quite the whole kernel, since a small part of the bran is removed by sifting as if for human consumption. It seemed desirable, therefore, to test a meal from which nothing had been taken away. But as it did not seem to us probable that the difference in the meal represented by the small amount of bran removed in sifting would of itself appreciably influence the result of feeding, and as we wished, if possible, to determine whether the maize kernel contains an appreciable amount of the blacktongue preventive, it was determined to work with a diet containing as large an amount of whole meal as possible and yet one that so far as could then be judged was adequate for maintenance in all other respects. With these considerations in mind we carried out Experiment 1.

EXPERIMENT 1

This was a test of the blacktongue preventive action of whole white maize meal which was incorporated in test diets No. 149 and No. 149A. (Table 2.) These diets, which are identical except that the butterfat of one is quantitatively replaced by cod-liver oil in the other, are a slight modification of a maize diet studied by McCollum, Simmonds, and Pitz (8), and by them considered complete for normal growth of the rat to normal adult size, and for that reason selected by us for this study. Each contains 450 grams of whole-maize meal in a ration of slightly less than 2,400 calories. Suitable portions of one or the other of these diets were offered daily to each of seven test animals, dogs 29, 40, 52, 54, 57, 65, and 73. One of these dogs served during two separate periods, so that eight tests in all are to be considered. The significant details relating to each of the test animals are presented in the following:

Dog 29.—Male Acquired May 9, 1923, between which date and January 11, 1924, served in a number of experiments and suffered four attacks of blacktongue, the latest of which began January 7, 1924. On a miscellaneous stock diet from January 11 to February 5, 1924.

February 5, 1924: In good condition; weighs 11.1 kilograms; begins test diet No. 149. (Table 2.)

On February 17, 1924, at the end of a period of 12 days, presented the first signs of an attack of blacktongue, an injection of the floor of the mouth. Further history not relevant.

Dog 40.—Male. Whelped in the laboratory June 26, 1923, and reared on a stock diet. Up to February 20, 1924, served in a number of experiments and suffered two attacks of blacktongue, the later one of which began February 19, 1924. On a stock diet for reconditioning from February 20 to March 11, 1924.

March 11, 1924: In good condition; weighs 9.2 kilograms; begins diet No. 149.

On April 23, 1924, at the end of a period of 43 days, presented the first signs of an attack of blacktongue, an injection of the floor of the mouth. Weight was 11 kilograms. Further history not relevant.

Dog 52.—Bitch. Acquired September 25, 1923. Up to February 20, 1924, served in a number of experiments and suffered two attacks of blacktongue, the later one of which began February 18, 1924. On a stock diet for reconditioning from February 20 to March 11, 1924.

March 11, 1924: In good condition; weighs 9.7 kilograms; begins test diet No. 149.

On July 31, 1924, at the end of a period of 142 days, presented the first signs of an attack of blacktongue, an injection of the floor of the mouth. Weighs 10 kilograms. Further history not relevant.

Dog 54.—Bitch. Acquired September 25, 1923. Up to January 11, 1924, served in a number of experiments and suffered an attack of blacktongue which began November 28, 1923. On reconditioning diets from January 11 to March 25, 1924.

March 25, 1924: In good condition; weighs 8.1 kilograms; begins test diet No. 149A. (Table 2.)

On June 5, 1924, at the end of a period of 72 days, presented the first signs of an attack of blacktongue, an injection of the floor of the mouth and a slight reddening of the mucosa of the upper lip on each side. Weighs 8 kilograms. Further history not relevant.

Dog 57.—Male. Acquired September 25, 1923. Up to January 15, 1924, served in a number of experiments and suffered two attacks of blacktongue, the latter of which began December 13, 1923. From January 15 to February 5, 1924, on a miscellaneous stock diet for reconditioning.

February 5, 1924: In good condition; weighs 9.7 kilograms; begins test diet No. 149.

On February 23, 1924, at the end of a period of 18 days, presented the first signs of blacktongue, an injection of the floor of the mouth, of the mucosa of the cheeks, and of the anterior faucial pillars. Weighs 10 kilograms. Begins reconditioning diet.

February 25, 1924: Redness of mucosa of the floor and cheeks is less pronounced.

February 26, 1924: Redness has practically completely faded. Weighs 9.9 kilograms.

March 25, 1924: In good condition; weighs 10.1 kilograms; begins test diet No. 149A.

On April 11, at the end of a period of 17 days, presented the beginning signs of an attack of blacktongue, an injection of the floor of the mouth. Further history not relevant.

Dog 65.—Bitch. Acquired January 28, 1924. Kept on a miscellaneous stock diet to February 5, 1924.

February 5, 1924: In good condition; weights 6.7 kilograms; begins test diet No. 149.

April 22: Weighs 7.7 kilograms.

On April 27, 1924, at the end of a period of 77 days, presented the first signs of an attack of blacktongue, a reddening of the mucosa of the floor of the mouth. Further history not relevant.

Dog 73.—Bitch. Acquired March 19, 1924. On stock diet up to April 1, 1924.

April 1, 1924: In good condition; weighs 7.7 kilograms; begins test diet No. 149A.

July 8, 1924: Weighs 10.2 kilograms.

On July 12, 1924, or 102 days after beginning the test, this animal presented an injection of the mucosa of the floor of the mouth suggestive of a beginning attack of blacktongue. Two days later this was no longer perceptible, nor was there any reappearance of signs of blacktongue during a further period of observation of 38 days which ended August 19, 1924, on which date this experiment was discontinued.

Results and conclusions.—Six of the seven dogs developed blacktongue in from 12 to 142 days after beginning the test. The seventh (dog 73) presented evanescent evidence very suggestive but not conclusive of blacktongue at the end of a period of 102 days. The observation of this animal was discontinued at the end of 140 days, so that the possibility is not excluded that a definite attack of blacktongue would have developed had the observation period been longer. One of the test animals (dog 57) served during two separate periods and developed an attack of blacktongue in each. Thus the six animals in which definite evidence of blacktongue developed experienced, in all, seven attacks. Six of these appeared at the end of periods of not over 77 days in duration, and the seventh (dog 52) at the end of a period of 142 days.

The unusually long interval before the development of the attack in one and the occurrence of but evanescent indications of an attack in another of the experimental animals, even though the observa-

tion period in the latter was but 140 days, suggest, by contrast with our experience with basic diet No. 123 (including certain of its modifications (3)), that the test diets under consideration may have possessed slight preventive properties. The difference is not very notable and, such as it is, can not be attributed, altogether at least, to the character and increased quantity of the maize, since one of the test diets (No. 149), unlike our standard basic diet (No. 123), contained some butter, which, as will presently be seen, while a poor source is not entirely devoid of the preventive factor, a fact that was not fully appreciated when this experiment was planned. This experiment is therefore not conclusive. Notwithstanding this, however, the evidence quite clearly indicates that, at best, this cereal is a very poor source of the blacktongue preventive.

Recalling the indications of its poverty in or lack of the pellagra preventive it would appear that maize, if it contains any, is a poor source of the preventive for both blacktongue and pellagra.

WHEAT

The important place among the cereals held by wheat and a desire to compare it with maize led us to test its blacktongue preventive potency. The following experiment was accordingly carried out.

EXPERIMENT 2

For the present purpose, wheat ground in this laboratory into a meal was, without sifting, incorporated in a diet, No. 128, the composition of which is shown in Table 3. This, as may be seen by reference to Table 1, is essentially diet No. 123, the maize meal of which has been quantitatively replaced by the ground wheat, of which there are, therefore, 400 grams in each 2,400-calorie portion. Some of this diet was daily offered to each of eight test animals—dogs 5, 9, 13, 14, 29, 38, 44, and 47. The significant details relating to each are briefly as follows:

Dog 5.—Bitch. Acquired November 8, 1921. Has served in a number of experiments and has suffered two attacks of blacktongue, the later one of which began August 28, 1923. On stock diet from September 8, 1923, to January 29, 1924 Whelped a litter of seven pups November 25, 1923, six of which survived and were weaned in good condition January 17, 1924.

January 29, 1924: In good condition; begins diet No. 128. (Table 3.)

On August 2, 1924, at the end of a period of 186 days, presented the first signs of blacktongue, a reddening of the mucosa of the cheeks. To this there was added on August 3 a reddening of the mucosa of the floor of the mouth and of that of the upper lip on the left side. Further history is not relevant.

Dog 9.—Male. Acquired April 1, 1923. Has served in a number of experiments and has suffered four attacks of blacktongue of which the latest began February 12, 1924. On stock diet from February 13, to March 11, 1924.

March 11, 1924: In good condition; begins diet No. 128.

On July 31, 1924, at the end of a period of 142 days, presented the first signs of an attack of blacktongue, a reddened patch on the mucosa of the upper lip, in the region of the canines, on each side, and a slight reddening of the mucosa of the floor of the mouth. Further history is not relevant.

Dog 13.—Male. Acquired April 7, 1923. Up to November 28, 1923, served in several experiments and suffered three attacks of blacktongue, of which the latest began November 24, 1923. On a reconditioning diet from November 28 to December 11, 1923.

December 11, 1923: In good condition; begins diet No. 128.

On February 20, 1924, or at the end of a period of 71 days, presented an injection of the floor of the mouth which was slightly more pronounced the next day, February 21. This reddening then persisted without notable change for some 48 hours, then rapidly faded so that the mouth was normal on February 25.

On July 11, or at the end of an additional period of 142 days, presented renewed signs of blacktongue, an erythematous patch on the mucosa of the upper lip on each side in the region of the canines and a slight reddening of the floor of the mouth. Further history not relevant.

Dog 14.—Male. Acquired April 7, 1923. Up to November 28, 1923, served in several experiments and suffered four attacks of blacktongue, of which the latest began October 30, 1923. On a reconditioning diet from November 28 to December 11, 1923.

December 11, 1923: In good condition; begins diet No. 128.

On June 24, 1924, or at the end of a period of 196 days, presented the first signs of an attack of blacktongue, a slight reddening of the mucosa of the floor of the mouth. Further history not relevant.

Dog 29.—Male. Acquired May 9, 1923. Up to November 27, 1923, served in several experiments and suffered three attacks of blacktongue, of which the latest began October 18, 1923. On a reconditioning diet from November 27 to December 11, 1923.

December 11, 1923: In good condition; begins diet No. 128.

On January 7, 1924, at the end of a period of 27 days, presented the first signs of an attack of blacktongue, a reddening of the mucosa of the floor of the mouth.

Dog 38.—Male. Whelped in the laboratory June 26, 1923. Up to February 20, 1924, served in several experiments and suffered two attacks of blacktongue, the second one of which began February 14, 1924. On a reconditioning diet from February 20 to March 11, 1924.

March 11, 1924: In good condition; begins diet No. 128.

On June 24, 1924, at the end of a period of 105 days, presented the first signs of an attack of blacktongue, a reddening of the floor of the mouth. Further history not relevant.

Dog 44.—Male. Whelped in the laboratory June 26, 1923. Up to December 27, 1923, served in one experiment and suffered an attack of blacktongue which began October 28, 1923. On a reconditioning diet from December 27, 1923, to January 29, 1924.

January 29, 1924: In good condition; begins diet No. 128.

On August 13, 1924, at the end of a period of 197 days, presented the first signs of an attack of blacktongue, reddened patches on the mucosa of the upper lip on each side. Further history not relevant.

Dog 47.—Male. Acquired August 18, 1923. Up to November 28, 1923, served in an experiment and suffered an attack of blacktongue, which began September 28, 1923. On a reconditioning diet from November 27 to December 20, 1923.

December 20, 1923: In good condition; begins diet No. 128.

On January 7, 1924, at the end of a period of 18 days, presented the first signs of an attack of blacktongue, a reddening of the floor of the mouth. Further history not relevant.

Results and conclusions.—As is evident, all eight of the test animals developed blacktongue. It is noteworthy, however, that in but two of the dogs did the attack have its onset at the end of periods shorter than 71 days. In five of the eight animals the first signs of the attack made their appearance at the end of periods varying between 105 and 197 days—that is, after periods very definitely longer than is the rule in the case of dogs fed diet No. 123. This delay in the development of the disease would appear to indicate that diet No. 128 had exercised appreciable but incomplete blacktongue preventive action and, therefore, that whole wheat contains the blacktongue preventive, but in small amount. Compared with the result of the experiment with whole maize, the outcome of the test of whole wheat suggests that this is probably a slightly better source of the blacktongue preventive than is the maize.

WHEAT GERM

While the preceding experiment with whole wheat was under way, tests were made of the blacktongue-producing potency of a number of diets in which were included varying amounts of commercial wheat germ as a source of "vitamin B." The results of one of these tests which happened to be with a diet that included an unusually large quantity of the wheat germ, suggested rather strongly that this germ might possess definite blacktongue-preventive action. This led us to carry out the following experiment:

EXPERIMENT 3

This was a test of the blacktongue-preventive action of ether-extracted wheat germ. The wheat germ was a commercial product from which we had extracted the fat by percolation with ether (U. S. P.) at air temperature.[1] It was incorporated in a diet, No. 197, the composition of which is shown in Table 4. As may be seen, each 2,400 calorie portion contains 180 grams of the extracted germ. It may be noted, too, that it contains a considerable amount of cornstarch; notably less, however, as was noted in the preceding section in connection with maize, than has been found to be lacking in appreciable blacktongue-preventive action. This diet is somewhat similar to our basic diet No. 123 (Table 1), from which it differs notably, however, in that the wheat germ and the starch of the former completely replace the corn meal and cowpeas of the latter. Suitable portions of the diet were daily offered to each of nine test-

[1] Various batches of this ether-extracted wheat germ were found by Assistant Chemist C. G. Remsburg, in the Division of Chemistry of the Hygienic Laboratory, to contain from 0.02 to 0.34 per cent of "ether extract."

animals, dogs 54, 61, 65, 70, 71, 78, 86, 87, and 88. The significant details relating to each are presented in the following:

Dog. 54—Bitch. Acquired September 25, 1923. Up to June 17, 1924, served in several experiments and suffered two attacks of blacktongue of which the second began June 5, 1924. On stock diet for reconditioning from June 17 to July 23, 1924. On an experimental diet, which included some wheat germ, from July 23, 1924, to May 26, 1925.

May 26, 1925: In good condition; begins wheat-germ diet No. 197. (Table 3.)

On September 19, 1925, at the end of 136 days, this animal presented a slight but very suggestive reddening of the mucosa of the floor of the mouth, which, however was no longer perceptible 24 hours later. No further evidence suggesting blacktongue appeared during the remainder of the period of observation, which ended May 26, 1926. In good condition at the end of one year on the wheat-germ diet.

Dog 61.—Male. Whelped in the laboratory November 4, 1923. Up to May 27, 1924, served in one experiment and suffered one attack of blacktongue, which began May 21, 1924. On reconditioning diet from May 27 to July 23, 1924. From July 23, 1924, to May 26, 1925, on an experimental diet, which included a considerable amount of wheat germ.

May 26, 1925: In good condition; begins wheat-germ diet No. 197.

On January 5, 1926, or at the end of a period of 224 days, there were noted the first signs of an attack of blacktongue, which ended in death on January 20, 1926.

Dog 65.—Bitch. Acquired January 28, 1924. Up to May 27, 1924, served in one experiment and suffered an attack of blacktongue. On stock diet for reconditioning from May 27 to July 23, 1924. On an experimental diet, which included wheat germ from July 23, 1924, to May 26, 1925.

May 26, 1925: In good condition; begins wheat-germ diet No. 197.

On February 3, 1926, at the end of 253 days, this animal presented a slight but suggestive reddening of the mucosa of the floor of the mouth and of the cheeks which, however, had completely faded 24 hours later. No further evidence suggesting blacktongue appeared during the remainder of the period of observation, which ended May 26, 1926. In good condition at the end of one year on the wheat-germ diet.

Dog 70.—Male. Whelped in the laboratory November 25, 1923. Up to May 14, 1924, served in one experiment and suffered an attack of blacktongue, which began May 13, 1924. On stock diet for reconditioning from May 14 to July 23, 1924. On an experimental diet, which included wheat germ, from July 23, 1924, to May 26, 1925.

May 26, 1925: In good condition; begins wheat-germ diet No. 197.

On September 15, 1925, or at the end of a period of 112 days, presented the first signs of an attack of blacktongue, reddened lesions on the mucosa of the upper lip opposite the canines, and an injection of the floor of the mouth. Further history not relevant.

Dog 71.—Male. Whelped in the laboratory November 25, 1923. Reared on miscellaneous stock diets. On an experimental diet, which included wheat germ, from July 23, 1924, to May 26, 1925.

May 26, 1925: In good condition; begins wheat-germ diet No. 197.

May 26, 1926: Completes one year on the wheat-germ diet in good condition; has presented no recognizable evidence of blacktongue during the year.

Dog 78.—Male. Acquired June 9, 1924. On an experimental diet which included wheat germ from July 23, 1924, to May 26, 1925.

May 26, 1925: In good condition; begins wheat-germ diet No. 197.

On August 11, 1925, at the end of a period of 77 days, presented the first signs of an attack of blacktongue, which ended in death during the night of August 22–23, 1925.

Dog 86.—Bitch. Whelped in the laboratory October 12, 1924. On stock diet to April 28, 1925. From April 28 to May 26, 1925, on an experimental diet which included wheat germ.

May 26, 1925: In good condition; begins wheat-germ diet No. 197.

On December 27, 1925, at the end of 215 days, presented a suggestive reddening of the mucosa of the floor of the mouth which gradually faded during the succeeding 48 hours. Presented no other evidence of blacktongue at any time during a further period of observation which ended May 26, 1926. In good condition at the close of the year on the wheat-germ diet.

Dog 87.—Bitch. Whelped in the laboratory October 12, 1924. On stock diet up to April 28, 1925. From April 28 to May 26, 1925, on an experimental diet which included wheat germ.

May 26, 1925: In good condition; begins wheat-germ diet No. 197.

May 26, 1926: Completes one year on the wheat-germ diet. Is in good condition. Has presented no recognizable evidence of blacktongue at any time during this feeding period.

Dog 88.—Male. Whelped in the laboratory October 12, 1924. On stock diet to April 28, 1925. From April 28 to May 26, 1925, on an experimental diet which included wheat germ.

May 26, 1925: In good condition; begins diet No. 197.

On December 18, at the end of a period of 206 days, presented the first signs of an attack of blacktongue, reddened lesions of the mucosa of the upper lip, reddening of the mucosa of the floor of the mouth and of that of the cheeks. Further history not relevant.

Results and conclusions.—From the foregoing it appears that four of the nine test animals, namely, dogs 61, 70, 78, and 88, developed definite attacks of blacktongue at the end of 224, 112, 77, and 206 days, respectively; three (dogs 54, 65, and 86) presented suggestive but fleeting evidence of blacktongue at the end of 136, 253, and 215 days, respectively; while two presented no recognizable evidence of the disease during the period of observation of one year. The notable delay in the development of two of the four definite attacks, the occurrence of but evanescent signs in three, and of no recognizable evidence whatever in two of the test animals would seem clearly to indicate that diet No. 197 had exercised definite but not fully complete blacktongue-preventive action, and, thus, that commercial wheat germ contains the blacktongue preventive. Considering quantity, and also that, so far as can be judged, the other components of the test diet (No. 197) probably contributed little or nothing to its blacktongue-preventive potency, it may be concluded that wheat germ is a relatively good, if not rich, source of the blacktongue preventive. Since wheat-germ diet No. 197 contains less than one-half as much wheat germ as diet No. 128 (Experiment 2, Table 3) contains of whole wheat, and since the protective action of the wheat-germ diet seems to have been, if anything, more marked that that of the whole-wheat diet, even with its included cowpeas, it would seem per-

missible to infer that gram for gram extracted wheat germ contains more than twice as much of the blacktongue preventive as does whole wheat.

It may here be noted that the favorable outcome of the foregoing study in the dog suggested the desirability of a similar study in human pellagra with the result elsewhere (9) already reported, that a daily supplement of 150 grams of commercial wheat germ was found effective as a preventive of the human disease. It is apparent, therefore, that commercial wheat germ contains and may be rated as a relatively good source of the preventive for both the human and the canine disease, pellagra and blacktongue.

COWPEA

The cowpea (*Vigna sinensis*) is one of the favorite legumes of our Southern States, the area in which pellagra is most prevalent. It not infrequently appears as a component of diets associated with pellagra. Its pellagra-preventive potency was studied in 1919 by Goldberger and Tanner (4), who concluded that the dry cowpea has little, if any, pellagra-preventive value. More recently Goldberger and Wheeler (9) were led to study this legume again and found that a supplement of 150 grams a day had a beneficial, delaying, but not quite a complete preventive action, and thus concluded (*a*) that the pellagra preventive is present in the cowpea, but in relatively small amount, and (*b*) that it is at least appreciably inferior in pellagra-preventive potency to the wheat germ.

Our experience with the cowpea in experimental blacktongue parallels quite closely the foregoing experience with it in the human disease, as may be seen in the following experiments:

EXPERIMENT 4

This was a test of the blacktongue-preventive action of the dried California black-eyed pea, one of the favorite varieties of the cowpea. It was incorporated in a diet, No. 286, the composition of which is shown in Table 5. As may there be seen, a 2,400-calorie portion of that diet contains 360 grams of the dried legume. Suitable portions were daily offered to each of five test animals, namely, dogs 15, 40, 52, 113, and 114. The significant details relating to each are briefly as follows:

Dog 15.—Male. Acquired April 14, 1923. Has served in several experiments and has suffered four attacks of blacktongue, the latest of which began December 25, 1924. On stock diet from December 21, 1926, to March 3, 1927.

March 3, 1927: In good condition; weighs 10.2 kilograms; begins cowpea-diet No. 286. (Table 5.)

On June 28, at the end of a period of 117 days, presented the first signs of an attack of blacktongue, a faint red patch on the mucosa of the upper lip opposite the canine teeth of each side and an injection of the floor of the mouth. The

attack slowly progressed with some remissions, and by July 12 was well marked and, besides showing distinctive buccal lesions, was characterized by a well-marked scrotal eruption. On the latter date the dog was killed with illuminating gas for histopathological study (5).

Dog 40.—Male. Whelped in the laboratory June 26, 1923. Has served in several experiments and suffered three attacks of blacktongue, of which the latest began April 23, 1924. On stock diet from December 21, 1926, to March 3, 1927.

March 3, 1927: In good condition; weighs 11.2 kilograms; begins test diet No. 286.

On July 9, at the end of a period of 98 days, presented the first buccal signs of blacktongue, a slight band of erythema on the mucosa of the upper lip of each side and an injection of the mucosa of the faucial pillars. A scrotal eruption appeared on June 28. By July 11 the mouth lesions had become very pronounced and treatment was started. Further history not relevant.

Dog 52.—Bitch. Acquired September 25, 1923. Has suffered several attacks of blacktongue, the latest of which began October 6, 1925. On stock diet from December 21, 1926, to March 3, 1927.

March 3, 1927: In good condition, weighs 10 4 kilograms; begins diet No. 286.

July 12: In good condition; weighs 10 3 kilograms; has presented no indications of blacktongue; but by reason of the development of blacktongue by some of the other dogs of this lot, the experiment is this day discontinued.

Dog 113.—Bitch. Acquired January 17, 1927. On stock diet to March 3, 1927.

March 3, 1927: In good condition; weighs 9.5 kilograms; begins diet No. 286.

July 8: Three days ago presented a very suggestive injection of the floor of the mouth and a flushing of the mucosa of the cheeks. Yesterday there was present also an ill-defined reddened band on the mucosa of the upper lip. To-day the mouth appears normal.

July 12: Food consumption has for several weeks been on a declining scale. Weighs 7.8 kilograms. Experiment is this day discontinued.

Dog 114.—Male. Acquired February 17, 1927. On stock diet to March 3, 1927.

March 3, 1927: In good condition; weighs 9.4 kilograms; begins diet No. 286.

May 10: Appetite considerably dulled and food consumption diminished during the past seven or eight days; weighs 9 kilograms.

On May 15, at the end of a period of 73 days, presented the first signs of an attack of blacktongue, an injection of the mucosa of the floor of the mouth. Further history not relevant.

Results and conclusions.—Thus, three of the test animals developed blacktongue at the end of 73, 98, and 117 days, respectively, and one (dog 113) presented very suggestive but transient indications of blacktongue at the end of 127 days. Only one (dog 52) of this lot of test animals presented no recognizable evidence of blacktongue at any time during the experimental period of 131 days. Clearly, cowpeas diet No. 286 was inadequate to prevent the development of blacktongue. The development of but transient signs of the disease in one and of none at all in another of the five dogs would, however, appear to suggest a slight delaying or protective action. That this interpretation is probably correct is indicated by the result of the following experiment with a larger ration of cowpeas.

EXPERIMENT 5

This was a further test of the blacktongue-preventive action of the dried California black-eyed pea, or cowpea. For this purpose it was incorporated in diet No. 299 (Table 6), but the quantity per 2,400-calorie portion was increased to 450 grams, or 25 per cent more than in diet No. 286 (Table 5). Suitable portions of this test diet were daily offered to each of five test animals, namely, dogs 40, 52, 113, 114, and 125. It may be noted that four of these animals (dogs 40, 52, 113, and 114) served in experiment 4 with cowpea-diet No. 286. The significant details relating to each of the animals are as follows:

Dog 40.—On stock diet for reconditioning from July 12 to August 23, 1927.

August 23, 1927: The attack of blacktongue which, as noted in the preceding experiment, began on July 9 rapidly cleared up under treatment. In good condition; weighs 12.1 kilograms; begins cowpea diet No. 299. (Table 6.)

April 10, 1928: Has presented no recognizable evidence of blacktongue since the beginning of this experiment seven and a half months ago; weighs 11.5 kilograms.

Dog 52.—On stock diet from July 12, the termination of the preceding experiment, to August 23, 1927.

August 23, 1927: In good condition; weighs 11.2 kilograms; begins test diet No. 299.

April 10, 1928: Has presented no recognizable evidence of blacktongue since the beginning of the present experiment seven and a half months ago; weighs 10.2 kilograms.

Dog 113.—On stock diet for reconditioning from July 12 to August 23, 1927.

August 23, 1927: In good condition; weighs 10.2 kilograms; begins test diet No. 299.

April 10, 1928: Food consumption has been variable; weighs 8.4 kilograms; has presented no recognizable evidence of blacktongue during the seven and one-half months since the present experiment began.

Dog 114.—On stock diet for reconditioning from June 30 to August 23, 1927, during which period all evidence of the attack of blacktongue which, as noted in connection with the preceding experiment, began May 15, completely cleared up.

August 23, 1927: In good condition; weighs 10.7 kilograms; begins test diet No. 299.

April 10, 1928: Presented transient buccal signs of blacktongue October 27–November 4; November 19–20, 1927, and February 18-19, 1928; weighs 9.8 kilograms; has presented no recognizable indications of blacktongue since the disappearance of the suggestive but evanescent lesion of the upper lip noted February 18, 1928.

Dog 125.—Bitch. Acquired May 25, 1927. On stock diet to August 23, 1927.

August 23, 1927: In good condition; weighs 7.7 kilograms; begins test diet No. 299.

April 10, 1928: Has lost some weight; weighs 6.5 kilograms; is lively and in good condition; has presented no recognizable evidence of blacktongue during the seven and one-half months since the experiment began.

Results and conclusions.—The result of this experiment with diet No. 299 presents a very distinct contrast to that of the immediately preceding one with diet No. 286. Of the five test animals on diet No. 299 only one (dog 114) developed any indications of blacktongue,

and these were mild and transient. The other four at no time during the experimental period of 7½ months (231 days) presented any recognizable evidence of the disease. Cowpea-diet No. 299 would thus seem to possess distinctly appreciable, even though not fully complete, blacktongue-preventive action. Considering the quantity of the cowpea in the test diet, we may conclude that while the cowpea (California black-eyed pea) contains the blacktongue preventive, it contains it in a relatively very small amount, probably not more than, if as much as, about one-half that contained in ether-extracted wheat germ. Recalling the experience above cited with the cowpea in human pellagra, it is evident that this dry legume, while containing it, is a poor source of the preventive for both pellagra and blacktongue.

SOY BEAN

In 1918 Goldberger and Tanner (4) studied the pellagra-preventive value of the dry soy bean and found that pellagra developed in several patients notwithstanding that they had daily ingested what was regarded as a liberal daily quantity, approximately 85 grams (3 ounces), as a supplement to the diet of the institution in which the study was made. This experience in the human disease suggested the desirability of testing the preventive action of this legume in the canine disease. This was accordingly done very early in our study of experimental blacktongue. In that test the experimental diet used (No. 110, the composition of which is shown in Table 7) was a simplified replica of the soy bean supplemented diet that had failed in the prevention of pellagra in the above-mentioned study of Goldberger and Tanner. The result of that test, using three dogs as test animals, duplicated the experience in the human disease; it failed of any indications of blacktongue-preventive action.

The quantity of soy beans included in the diet used in that experiment appearing to us as relatively large, the frank failure in blacktongue prevention seemed conclusive. But, as our investigations proceeded, we came increasingly to feel that the action of a larger quantity of this legume should be studied before final conclusions as to preventive potency could properly be drawn. Accordingly, we have quite recently tested the preventive action of the soy bean anew as shown in the following experiment:

EXPERIMENT 6

This was a test of the blacktongue-preventive action of the dried soy bean (mammoth yellow variety) when incorporated in a diet (No. 287), the composition of which is shown in Table 8. As may be seen, each 2,400-calorie portion contains 360 grams of the bean. It may be noted, too, that, like wheat-germ diet No. 197, it contained cornstarch as a conspicuous component quantitatively. Suitable

portions of this diet were daily offered to each of five test animals, namely, dogs 29, 59, 84, 112, and 116. The significant details relating to each of these animals are as follows:

Dog 29.—Male. Acquired May 10, 1923. Has suffered several attacks of blacktongue, the latest of which began April 17, 1925. On yeast-containing test diets from May 25, 1925, to March 15, 1927. On stock diet from March 15 to April 6, 1927.

April 6, 1927: In good condition, weighs 10.1 kilograms; begins soy-bean diet No. 287. (Table 8.)

May 3: Food consumption has been excellent since beginning the soy-bean diet; weighs 10 kilograms.

June 7: Appetite and food consumption were excellent up to May 16. Since that date the food consumption has been somewhat variable; weighs 9.6 kilograms.

July 5: Appetite has been increasingly variable and food consumption somewhat reduced during the past month; weighs 9.4 kilograms. Presents this morning suggestive buccal signs of blacktongue, reddened patches of mucosa of the upper lip on the left side and flushing of the mucosa of the cheeks.

July 8: Mouth lesions have faded.

July 21: A slow decline in weight continues. Presents this morning a definite reddening of the floor of the mouth and slight reddening of the mucosa of the upper lip of each side.

July 22: Mouth appears normal this morning.

August 16: Weighs 8.7 kilograms. Suggestive buccal signs of blacktongue, reddening of the floor of the mouth and of the mucosa of the cheeks again in evidence.

August 18: Mouth is well-nigh normal this morning.

September 17: Presents this morning, at end of a period of 164 days, definite beginning signs of blacktongue, a reddened bandlike patch on mucosa of the upper lip of each side, reddening of the floor of the mouth.

September 27: Buccal lesions have become quite pronounced. Weighs 7.2 kilograms. Diet changed for reconditioning. Further history not relevant.

Dog 59.—Bitch. Whelped in the laboratory November 4, 1923. Has served in one experiment but has not had blacktongue. On stock diet from March 17, 1927, to April 6, 1927.

April 6, 1927: In good condition; weighs 6 kilograms; begins soy-bean diet No. 287.

April 10, 1928: Has been on the soy-bean diet one year, during which period has at no time presented any recognizable evidence of blacktongue. Weighs 5.6 kilograms. Experiment is discontinued.

Dog 84.—Male. Acquired March 2, 1925. Has suffered an attack of blacktongue, which began April 23, 1925. On yeast-containing diets from May 23, 1925, to March 15, 1927. On stock diet from March 15, 1927, to April 6, 1927.

April 6, 1927: In good condition; weighs 10.6 kilograms; begins soy-bean test diet No. 287.

April 10, 1928: Appetite and food consumption variable but fairly good until about January 1, 1928. Since then the food consumption has become markedly reduced with coincident marked loss in weight. Weighs 6.1 kilograms; is much emaciated; mucous membranes are pale; is lively. Has presented no recognizable evidence of blacktongue at any time during the period of the experiment, now a full year in duration and terminated this day.

Dog 112.—Bitch. Acquired December 22, 1926. Except for a period of nine days—March 8–17—on stock diet to April 6, 1927.

April 6, 1927: In good condition; weighs 7.3 kilograms; begins soy-bean diet No. 287.

April 10, 1928: In good condition; weighs 8.2 kilograms. Has presented no recognizable evidence of blacktongue at any time during the experimental period of one year. Experiment is discontinued.

Dog 116.—Male. Acquired February 16, 1927. Except for the period March 9–17 on stock diet to April 6, 1927.

April 6, 1927: In good condition; weighs 7.2 kilograms; begins soy-bean diet No. 287.

April 10, 1928: In good condition; weighs 6.9 kilograms. Has presented no recognizable evidence of blacktongue during the experimental period of one year. Experiment is discontinued.

Results and conclusions.—Of the five test animals one (dog 29) developed an attack of blacktongue; the others presented no recognizable evidence of the disease at any time during the experimental period of one year. This would seem to indicate that soy-bean test diet No. 287 possessed definitely appreciable but not fully complete blacktongue-preventive action, and thus that the soy bean, in contrast with the indications of our earlier experience with a smaller quantity of this legume, contains the blacktongue preventive, but in a relatively small amount. This amount would appear to be appreciably more than in the cowpea and considerably less than in the extracted wheat germ.

The experience with the soy bean in pellagra, above cited, would seem to indicate, and was at first interpreted as indicating, a complete lack of preventive properties, just as the result of our earlier test of the soy bean in blacktongue was interpreted as an indication of a complete lack of blacktongue-preventive properties. It is clear that the interpretation with respect to the blacktongue preventive was not justified, and it must therefore be equally clear that the interpretation of the experience in pellagra must be considered inconclusive. No test of the soy bean in pellagra in more liberal amount than that in the study above cited has been made, so that it is not possible to state, on the basis of actual trial, that the soy bean actually contains the pellagra preventive as we have found that it does of the blacktongue preventive. So far as it goes, however, the experience in the human disease is, at least, not inconsistent with that in the experimental disease of the dog.

MILK

The importance of milk as a food and the evidence of its pellagra-preventive value afforded by an epidemiological study of the relation of diet to pellagra incidence (10) and, still more, the direct demonstration by Goldberger and Tanner (11) that milk contains the essential pellagra-preventive factor or factors, led us, very early

in the course of our study, to begin tests of its blacktongue-preventive action. The results of these early tests (which dealt with dried milk, with fresh skim milk, and with a market buttermilk) tended to indicate that milk had but feeble blacktongue-preventive action. For various reasons, which need not be detailed, we did not consider those tests conclusive, and, therefore, have more recently carried out another study of milk (fresh skim milk) the details and results of which we present in the following:

EXPERIMENT 7

This was a test of the blacktongue-preventive action of a fresh skim milk for which we are indebted to Dr. L. A. Rogers, Director of the Research Laboratories of the Bureau of Dairy Industry of the Department of Agriculture. The milk when delivered to us was freshly separated. As a rule, departed from only over the week end or other holiday, this milk in 2-quart glass jars was allowed to stand in an ice box for not more than 24 hours before being used. Then, although already machine separated, as much of the bottom layer as was needed was siphoned off and, after being warmed slightly, offered to the test animals.[1] The milk, unless otherwise specified, was given by drench, an all-metal syringe of convenient capacity being used. The daily dose was at the rate of approximately 30 c. c. per kilogram of normal body weight. It was given as a supplement to basic blacktongue-producing diet No. 123. (Table 1) The test animals were five dogs—numbered 54, 65, 68, 71, and 110. The significant details relating to each of these animals are as follows:

Dog 54.—Bitch. Acquired September 25, 1923. Up to May 26, 1926, served in several experiments and suffered a number of attacks of blacktongue, the occurrence of the latest of which was suggested by an evanescent redness of the mucosa of the floor of the mouth on September 19, 1925. On stock diet for reconditioning from May 26 to August 3, 1926.

August 3, 1926: In good condition; weighs 8.7 kilograms; begins diet No. 123 with a daily supplement of 285 c. c. of skim milk, which this animal laps greedily.

August 4, 1927: Presents to-day, one year since beginning this test, a slight injection of the mucosa of the floor of the mouth.

August 6: The floor of the mouth continues injected. In addition the mucosa of the upper lip presents two reddened patches on each side opposite the canines.

August 7: Lip lesions have about faded out; floor continues somewhat injected.

August 9: Mouth is normal in appearance.

September 7, 1927: In good condition; weighs 8.5 kilograms; has been taking the skim milk, nearly always by lapping, for 13 months. Between August 4 and August 9, 1927, or at the end of one year, presented mild, evanescent signs of blacktongue. Further history not relevant.

Dog 65.—Bitch. Acquired January 28, 1924. Up to May 26, 1925, served in two experiments and suffered two attacks of blacktongue, the second of which

[1] Four samples of this skim milk examined by Assistant Chemist C. G. Remsburg in the Division of Chemistry, Hygienic Laboratory, were found to vary in fat content between 0.05 and 0.40 per cent.

was doubtful and was represented merely by an evanescent reddening of the floor of the mouth and mucosa of cheeks on February 3, 1926. On stock diet for reconditioning from May 26 to August 3, 1926.

August 3, 1926: In good condition; weighs 8.3 kilograms; begins diet No. 123 with a daily supplement of 270 c. c. of skim milk.

September 7, 1927: Has been receiving a daily supplement of 270 c. c. of skim milk by drench since August 3, 1926, or 13 months. Has presented no recognizable evidence of blacktongue during this period. Is in good condition. Weighs 9.3 kilograms. Further history not relevant.

Dog 68.—Bitch. Whelped in the laboratory, November 25, 1923. Up to May 26, 1926, served in two experiments, but did not have blacktongue. On stock diet from May 26 to August 3, 1926.

August 3, 1926: In good condition; weighs 9.3 kilograms; begins diet No. 123 with a daily supplement of 300 c. c. of skim milk by drench.

September 7, 1927: In good condition; weighs 9.8 kilograms. Has been receiving the milk supplement for 13 months. Has presented no recognizable evidence of blacktongue during this period. Further history not relevant.

Dog 71.—Male. Whelped in the laboratory November 25, 1923. Up to May 26, 1926, served in two experiments but had no blacktongue. On stock diet from May 26 to August 3, 1926.

August 3, 1926: In good condition; weighs 10.5 kilograms; begins diet No. 123 with a daily supplement of 330 c. c. of skim milk by drench.

September 9, 1926: Presents to-day, 37 days after beginning the test of skim milk, the first signs of an attack of blacktongue, an injection of the mucosa of the floor of the mouth. Further history not relevant.

Dog 110.—Bitch. Acquired October 29, 1926. Up to December 8, 1926, on stock diet.

December 8, 1926: In good condition; weighs 10.4 kilograms; begins diet No. 123 with a daily supplement of 315 c. c. of skim milk by drench.

September 7, 1927: In good condition; weighs 11.9 kilograms. Has been getting the skim milk daily for 9 months. Has presented no evidence of blacktongue during this period. Experiment is this day discontinued. Further history not relevant.

Results and conclusions.—Of the five test animals, one (dog 71) developed a well marked attack of blacktongue at the end of a period of 37 days; one (dog 54) developed slight transient evidence of an attack at the end of one year; the other three presented no recognizable evidence of blacktongue during the period of observation, which was one year for two and nine months for the third of these animals. Recalling that, in our experience, feeding with basic diet No. 123 has regularly resulted in an attack of blacktongue within a period only exceptionally longer than about two months, it follows that the skim milk supplement exercised a definitely appreciable but not fully complete blacktongue-preventive action. It may be concluded, therefore, that milk contains the blacktongue preventive, but that somewhat more than 30 c. c. daily per kilogram of body weight, at least of skim milk, may be needed to secure complete protection when used to supplement such basic diet as our No. 123.

In this connection it is of interest to recall that, in their study of the pellagra-preventive action of buttermilk, Goldberger and Tanner (11)

found that a supplement of 1,200 c. c. (40 ounces) was adequate for the complete prevention of the disease in their patients and incidentally expressed the opinion that a somewhat smaller quantity might possibly have served equally well. How much smaller was at the time not definitely stated, but we judge, on the basis of general observation and experience with milk, that this could probably have been some 200 or 300 c. c. In other words, it seems to us probable that about 900 or 1,000 c. c. of buttermilk as a supplement to the type of diet received by those patients would have been adequate for pellagra prevention with but little, if any, margin for safety.[1] It thus appears that milk contains the preventive for both blacktongue and pellagra, but, considered in relation to effective quantity, contains it in relatively small amount.

BUTTER

Very early in our study of blacktongue we began an investigation of butter. At the outset this was done in order to determine to what extent, if at all, the action of butter in blacktongue resembled that in pellagra. Working at the Georgia State Sanitarium with butter locally produced, Goldberger and Tanner (11) had found this ineffective in several cases of pellagra in patients weighing 51 to 57.5 kilograms, in spite of a daily consumption that for periods of three to upward of five months had averaged approximately 135 to 145 grams. In order to make the comparison of the effectiveness of butter as rigid as possible, our study in the dog was begun with some of the same butter as that used by Goldberger and Tanner in pellagra. Later, learning that Underhill and Mendel had found butter a potent curative and preventive agent in the Chittenden-Underhill syndrome in the dog (6),[2] a pathological condition which, at that time, it seemed probable might be identical with the experimental disease, blacktongue (12), with which we were working, we extended our study to include a test of butter secured from the same source (a creamery in Vermont) as that of some with which Underhill and Mendel worked. In this connection it may be noted that, since it seemed possible that butter from a northern dairying locality, such as that which formed the source of the butter used by Underhill and Mendel, might be more potent in the factor preventing blacktongue, and thus possibly also pellagra, than butter from the nondairying region in the vicinity of the Georgia State Sanitarium in central Georgia, Goldberger and Wheeler thought it worth while to make some

[1] Since a majority of those patients weighed about 60 kilograms, it would follow that somewhat less than 20 c. c. of buttermilk per kilogram of body weight served in that study as a pellagra preventive. Since, on the other hand, somewhat more than 30 c. c. of skim milk per kilogram of body weight of dog is needed for full prevention of blacktongue, it may be suggested that the dog's requirement for the preventive factor is probably about twice as large as man's per kilogram of body weight

[2] We are under obligation to the courtesy of Professors Underhill and Mendel for advance information of their finding with regard to butter, and for aid in securing for our use a supply of butter from the same source (in Vermont) as that of their own.

pellagra-preventive trials with some of this same northern butter. The results of these trials proved no more favorable, however, than of those previously reported with butter locally produced (1). They concluded, therefore, that while the pellagra preventive may be present in butter, the quantity of butter that must be eaten before its pellagra-preventive action becomes appreciable is so large as to indicate that this preventive, if present in the butter, is present in practically negligible quantity. As will presently be seen, our experience with butter in experimental blacktongue is in harmony with that just cited in pellagra, and thus very different from that reported by Underhill and Mendel (6) (7).

In the study of butter that we wish now to present we have used products from three distinct sources, namely, Milledgeville, Ga.; Beltsville, Md.; New Haven, Conn.

The Milledgeville butter was, as already stated, some of the same butter as that used by Goldberger and Tanner (11) in a study of its pellagra-preventive potency. It was part of the supply of the Georgia State Sanitarium which secured it in batches of a few pounds from farmers of the vicinity. In June, 1923, a considerable quantity of this butter was melted, the fat siphoned into glass jars, and thus sent by express to the Hygienic Laboratory. At the Hygienic Laboratory it was stored in the refrigerator room. This butter—or more precisely, butterfat—will be referred to as our Milledgeville butterfat.

The Beltsville butter was a batch of butter specially prepared for us October 2-3, 1923, from sweet cream of cows, 25 to 50 per cent pasture fed, of the Beltsville farm of the Bureau of Dairy Industry, United States Department of Agriculture, for which we are indebted to Dr. L. A. Rogers, director of its research laboratories. It was kept by us in the laboratory ice box until used.

The butter secured from New Haven was actually from a creamery in Vermont, and, as already explained, was the same as that from which Underhill and Mendel secured their butter. It was laid down early in July, 1924. Some of this butter was used as above stated in a study of pellagra prevention at the Georgia State Sanitarium (1). It was kept in cold storage at New Haven, Conn., until October, when a batch was forwarded to us at the Hygienic Laboratory. At the laboratory it was stored in its original form in wooden tubs or, after conversion into butterfat, in glass jars in the laboratory refrigerator room, from which small batches were, from time to time, withdrawn and kept in an ice box until used. Depending upon whether it was used in its original form or as butterfat, this product will be designated as Vermont butter or Vermont butterfat.

Our study of butter (including butterfat) is detailed in experiments 8-12, which follow:

EXPERIMENT 8

This was, first, a preventive test of Milledgeville butterfat and, second, a therapeutic test of Beltsville butter in immediately succeeding periods in the same animal, dog 47. The significant details are as follows:

Dog 47.—Male. Acquired August 18, 1923. On a stock diet to September 11, 1923.

September 11, 1923: In good condition. Weighs 9.2 kilograms. Begins Milledgeville butterfat diet No. 115, the composition of which is shown in Table 9. It may be remarked that basically and in blacktongue-producing potency this diet is much the same as the diet (No. 34), with which Goldberger and Wheeler (2) first succeeded in inducing blacktongue in the dog.

September 25: Weighs 9.2 kilograms. Daily food consumption during the past two weeks has averaged approximately 970 grams, representing 62 grams of butterfat, or fully 6.5 grams of butterfat per kilogram of body weight.

September 28: There are present this morning, at the end of a period of 17 days of butterfat diet No. 115, the first signs of an attack of blacktongue, an injection of the floor of the mouth, a reddening of the mucosa of the cheeks and of that of the upper lip opposite the canines.

October 4: Given 100 grams of fresh lean beef on September 28, September 29, and on October 2, so as to retard the progress and mitigate the severity of the attack preparatory to treatment with Beltsville butter, which is begun to-day with diet No. 115B, the composition of which is shown in Table 10.

October 16: Weighs 10.6 kilograms. The daily food consumption since the change to Beltsville butter diet No. 115B has averaged approximately 1,080 grams, representing 86 grams of Beltsville butter or fully 8 grams of butter per kilogram of body weight.

October 18: Presents this morning, 14 days since beginning the Beltsville butter diet No. 115B, buccal signs of the beginning of a relapse of the attack of blacktongue, an injection of the floor of the mouth. Further history not relevant.

Result.—The ingestion of the Milledgeville butterfat in a daily quantity that averaged fully 6.5 grams per kilogram of body weight was inadequate to prevent the development of an attack of blacktongue in this animal, nor was the ingestion of the Beltsville butter at a daily rate of fully 8 grams per kilogram of body weight adequate appreciably to effect the further progress or relapse of the attack.

EXPERIMENT 9

This, like the second period of the preceding experiment, was a test of the therapeutic potency of Beltsville butter. It was carried out in two animals, dogs 17 and 29, the significant details and results of which are as follows:

Dog 17.—Bitch. Acquired April 14, 1923. Up to October 16, 1923, served in two experiments and suffered two attacks of blacktongue, the second of which began October 9, 1923.

October 16, 1923: The buccal lesions of blacktongue that made their first appearance a week ago have subsided. Received 100 grams of fresh lean beef, therapeutically, on each of the past three days in order to mitigate the severity and retard the progress of the attack in preparation for the test of butter.

Weighs 10.4 kilograms. Begins Beltsville butter diet No. 115B, the composition of which is shown in Table 10.

October 21: Has been eating well, having regularly consumed all of the daily allowance of 1,000 grams of food, representing 80 grams of Beltsville butter, or fully 7.5 grams of butter per kilogram of body weight. Presents this morning, five days after beginning the butter treatment, faint patches of redness on the mucosa of the upper lip opposite the canine teeth; the mucosa of the floor of the mouth is suggestively injected.

October 22: Mouth appears about normal this morning. Yesterday ate approximately 1,165 grams of food, representing 93 grams of butter.

October 24: Floor of mouth again slightly reddened. Weighs 10.7 kilograms.

October 25: Injection of the floor of the mouth is somewhat more pronounced.

October 27: The buccal lesions of blacktongue have become still more pronounced and more extensive. During the past five days has consumed a daily average of approximately 930 grams of food, representing 75 grams of butter.

October 31: The buccal lesions have faded markedly during the past two or three days. Weighs 11 kilograms. Has consumed during the past four days a daily average of approximately 930 grams of food, representing 75 grams of butter, or fully 6.5 grams of butter per kilogram of body weight.

November 5: The buccal lesions have gradually reappeared during the past four days and are well marked this morning, 21 days after beginning treatment. Weighs 10.8 kilograms. Has consumed during the past five days an average of approximately 920 grams of food, representing 73 grams of butter a day, or fully 6.5 grams of butter per kilogram of body weight. The butter diet, seeming to be ineffective, is discontinued. Further history not relevant.

Dog 29.—Male. Acquired May 9, 1923. Up to October 9, 1923 had experienced two attacks of blacktongue, the second of which began September 30, 1923.

October 9, 1923: The attack of blacktongue that began nine days ago has subsided. Mouth is normal. Received 100 grams of lean fresh beef daily October 3–7 and 50 grams yesterday in order to retard the development and mitigate the severity of the attack in preparation for the test of butter. Weighs 10.4 kilograms. To-day begins Beltsville butter diet No. 115B, the composition of which is shown in Table 10.

October 16: Weighs 11 kilograms. Has eaten daily during the week an average of approximately 950 grams of food, representing 76 grams of Beltsville butter, or fully 6.5 grams of butter per kilogram of body weight.

October 18: Mucosa of the floor of the mouth is slightly reddened.

October 20: Injection of the floor of the mouth is more pronounced this morning.

October 23: Mouth appears about normal this morning. Weighs 11.2 kilograms. Daily food consumption during the past week has averaged 650 grams, representing 52 grams of butter, or fully 4.5 grams of butter per kilogram of body weight.

October 24: Floor of the mouth is again slightly injected.

October 25: Reddening of the mucosa of the floor of the mouth is quite pronounced this morning.

October 27: Reddening of the floor of the mouth persists.

October 30: Mouth is well-nigh normal this morning. Weighs 11.3 kilograms. Daily food consumption during the past week has averaged approximately 680 grams, representing 56 grams of butter or but little short of 5 grams of butter per kilogram of body weight.

November 1: Mouth is again about normal.

November 13: The mucosa of the floor of the mouth has, during the past week, become progressively more intensely reddened. In addition the mucosa of the

upper lip and of the cheeks has also become reddened, so that the animal now (34 days after beginning the Beltsville butter diet) presents well marked buccal lesions of blacktongue. Weighs 11.5 kilograms. The average daily food consumption during the past two weeks fell to 600 grams, representing 48 grams of butter or fully 4 grams per kilogram of body weight. Further history not relevant.

Result.—Thus, as in experiment 8, notwithstanding that the treatment with Beltsville butter was begun in both animals under favorable conditions, and that both ingested the butter at what would seem to be a liberal rate (which at the outset was fully 7.5 and 6.5 grams per kilogram of body weight, respectively), in neither animal was the progress of the attack appreciably affected.

EXPERIMENT 10

This was a further test of the blacktongue-preventive potency of Milledgeville butterfat which was now, it may be noted, 15 months old. The test animals were three dogs, numbered 5, 13, and 48. Each of the dogs was daily offered a liberal allowance of diet No. 180A containing the butterfat. The composition of this diet is shown in Table 11. The significant details relating to each animal are as follows:

Dog 5.—Bitch. Acquired November 8, 1921. Up to August 19, 1924, served in a number of experiments and suffered three attacks of blacktongue, the latest of which began August 2, 1924. On stock diet for reconditioning from August 19 to September 23, 1924.

September 23, 1924: In good condition. Weighs 7.7 kilograms. Begins Milledgeville butterfat diet No. 180A. (Table 11.)

October 1: Has been eating well. Weighs 7.8 kilograms. Has consumed during the past eight days a daily average of approximately 820 grams of food, representing 40 grams of butterfat, or 5 grams of butterfat per kilogram of body weight.

November 1: Has continued to eat well during the past month. Weighs 8.2 kilograms. Has regularly consumed the daily allowance of 800 grams of food, representing 38 grams of butterfat or fully 4.5 grams of butterfat per kilogram of body weight.

December 1: Food consumption has held up well. Weighs 8 8 kilograms. Has taken daily during the past month an average of approximately 770 grams of food, representing 37 grams of butterfat or fully 4 grams of butterfat per kilogram of body weight.

December 23: This morning, at the end of a period of 91 days, presents the first signs of an attack of blacktongue, a reddening of the mucosa of the floor of the mouth. Weighs 8.4 kilograms. Food consumption fell off markedly after the first of the present month, the daily average for the past 22 days being but 560 grams, which represents approximately 27 grams of butterfat or fully 3 grams of butterfat per kilogram of body weight. Further history not relevant.

Dog 13.—Male. Acquired April 7, 1923. Up to August 19, 1924, served in several experiments and suffered five attacks of blacktongue, of which the latest began July 11, 1924. On reconditioning diet from August 19 to September 23, 1924.

September 23, 1924: In good condition, weighs 9 kilograms, begins Milledgeville butterfat diet No. 180A.

October 1: Has been eating well. During the past eight days has consumed an average of approximately 935 grams of food, representing 45 grams of Milledgeville butterfat, or approximately 5 grams per kilogram of body weight.

November 1: Weighs 9.8 kilograms, has continued to eat well having regularly consumed during October the daily allowance of 1,000 grams of food, representing approximately 48 grams of butterfat, or fully 4.5 grams of butterfat per kilogram of body weight.

November 11: Weighs 10 kilograms. During the past 10 days has regularly consumed all of the daily allowance of 1,000 grams of food, representing 48 grams of butterfat.

December 1: Weighs 10 kilograms. During the past 20 days appetite was somewhat diminished. The daily food consumption for this period averages approximately 845 grams, representing 40 grams of butterfat, or approximately 4 grams of butterfat per kilogram of body weight.

January 1, 1925: Weight was 9.9 kilograms day before yesterday. Food consumption was further reduced during the past month; the daily intake has averaged but 715 grams, representing approximately 34 grams of butterfat, or a little short of 3.5 grams of butterfat per kilogram of body weight.

January 6: This morning, at the end of a period of 105 days, presents the first signs of an attack of blacktongue, a reddening of the mucosa of the floor of the mouth and of that of the cheeks. During the past five days the daily food consumption has averaged approximately 655 grams, representing 31 grams of butterfat. Weighs 9.8 kilograms. Further history not relevant.

Dog 48.—Bitch. Acquired August 20, 1923. Up to August 5, 1924, served in several experiments and suffered two attacks of blacktongue, of which the second began May 20, 1924. From August 5 to September 23, 1924, was on a reconditioning diet.

September 23, 1924: In good condition. Weighs 6.2 kilograms. Begins Milledgeville butterfat diet No. 180A.

October 1: Weighs 6.6 kilograms. Has been eating well. Has regularly consumed all of the daily allowance of 800 grams of food, representing 38 grams of Milledgeville butterfat or fully 5.5 grams of butterfat per kilogram of body weight.

October 28: Weighs 7 kilograms. Has continued to eat well, regularly consuming all of the daily allowance of 800 grams of food, representing 38 grams of butterfat, or slightly short of 5.5 grams of butterfat per kilogram of body weight.

November 4: Weighs 6.8 kilograms. Has been leaving some of the food nearly every day during the past seven days. The daily consumption has averaged approximately 580 grams, representing about 28 grams of butterfat, or approximately 4 grams of butterfat per kilogram of body weight.

December 2: Weighs 6.8 kilograms. During the past four weeks the daily food consumption has averaged approximately 565 grams, representing about 27 grams of butterfat, or slightly short of 4 grams of butterfat per kilogram of body weight.

December 30: Weighs 6.8 kilograms. The daily food consumption during the past four weeks has averaged approximately 540 grams, representing 26 grams of butterfat, or fully 3.5 grams of butterfat per kilogram of body weight.

January 27, 1925: Weighs 6.9 kilograms. During the past four weeks the daily food consumption has averaged approximately 540 grams, representing about 26 grams of butterfat, or slightly over 3.5 grams of butterfat per kilogram of body weight.

February 24: Weighs 6.7 kilograms. During the past four weeks the daily food consumption has averaged approximately 440 grams, representing about 21 grams of butterfat, or at a rate of approximately 3 grams of butterfat per kilogram of body weight.

March 10: During the past two weeks food consumption declined to a daily average of approximately 320 grams, representing 15 grams of butterfat. Weight has declined to 6.2 kilograms. Presents this morning, 168 days since beginning the Milledgeville butterfat diet, the first signs of an attack of blacktongue, a reddening of the mucosa of the floor of the mouth and slightly reddened patches on the mucosa of the upper lip opposite the canines. Further history not relevant.

Result.—It appears from the foregoing that all three test animals developed blacktongue, notwithstanding a liberal daily ingestion of the butterfat. The first significant buccal signs of the disease made their appearance in these animals at the end of 91, 105, and 168 days, respectively. This result, it may be noted, is in harmony with the result of the test of the same butterfat in Experiment 8 when it was but 3 months old.

EXPERIMENT 11

This was a study of Milledgeville butterfat (diet No. 180A) and of Vermont butterfat (diets No. 180B and No. 180C) in separate but immediately succeeding periods in each of four test animals, namely, dogs 9, 44, 66, and 73. When its use was begun, the Milledgeville butterfat was 15 to 16 months old, while the Vermont product, when it came into use, was about 6 months old in one case (dog 9) and about 11 months old in each of the other three cases. The significant details relating to each of the animals are briefly as follows:

Dog 9.—Male. Acquired April 1, 1923. Has served in several experiments and has suffered five attacks of blacktongue, of which the latest began July 31, 1924. On reconditioning stock diets from August 19 to October 1, 1924.

October 1, 1924: In good condition. Weighs 10.5 kilograms. Begins Milledgeville butterfat diet No. 180A, the composition of which is shown in Table 11.

November 11: Weighs 11.6 kilograms. Has been eating well, regularly consuming the daily allowance of 1,100 grams of food, representing approximately 53 grams of Milledgeville butterfat, or fully 4.5 grams of butterfat per kilogram of body weight.

November 25: Weighs 12 kilograms. Appetite has been less consistently good during the past two weeks. The daily food consumption has averaged approximately 1,030 grams, representing 49 grams of butterfat, or 4 grams per kilogram of body weight.

December 9: Weighs 11.7 kilograms. Appetite still further dulled. Daily food consumption during the past two weeks averages approximately 800 grams, representing 38 grams of butterfat, or upward of 3 grams per kilogram of body weight.

December 11: Presents this morning a slight, somewhat suggestive, streaky injection of the floor of the mouth.

December 18: The streaky redness of the floor persisted a few days, then faded. Mouth is about normal.

December 23: Weighs 11.7 kilograms. Food consumption during the past two weeks has averaged approximately 880 grams per day, representing 42 grams of butterfat, or fully 3.5 grams per kilogram of body weight.

December 25: This morning, at the end of a period of 85 days, presents the first definite signs of an attack of blacktongue, an injection of the mucosa of the floor of the mouth.

January 3, 1928: During the past 11 days food consumption has been considerably reduced, the daily average for this period being approximately 550 grams, representing 26 grams of butterfat. The buccal lesions (erythematous bands on the mucosa of the upper lip, reddened mucosa of the cheeks and of the floor of the mouth) now being well marked and the appetite having become reduced, it is deemed desirable to try to retard or arrest the progress of the attack preparatory to a change in the butter of the diet. Accordingly, 22 grams of dried brewery yeast is administered to-day.

January 4: Another dose of 22 grams of dried brewery yeast is administered and the diet is changed to Vermont butterfat diet No. 180B, the composition of which (shown in Table 11) is identical, except as to the butterfat, with that of Milledgeville butterfat diet No. 180A.

January 6: A third dose of 22 grams of yeast was administered yesterday. Yeast treatment is discontinued effective to-day. All buccal lesions have faded, and the appetite seems to be restored. Ate all food offered yesterday and the day before. Weighs 11.7 kilograms.

January 13: Weighs 11.8 kilograms. Has been eating well during the past week, regularly consuming the daily allowance of 1,100 grams of food, representing approximately 53 grams of Vermont butterfat, or fully 4 grams per kilogram of body weight.

February 3: Weighs 11.5 kilograms. Appetite has become dulled during the past week. The daily food consumption during this period has averaged approximately 730 grams, representing 35 grams of butterfat, or approximately 3 grams per kilogram of body weight.

February 24: Weighs 10.9 kilograms. Appetite has become further reduced during the past three weeks. The daily food consumption has averaged but 470 grams, representing approximately 23 grams of butterfat, or fully 2 grams per kilogram of body weight. Presents to-day, 51 days after the change from the Milledgeville to the Vermont butterfat diet, the first buccal signs of an attack, or perhaps of a relapse, of blacktongue. Further history not relevant.

Dog 44.—Male. Whelped in the laboratory June 26, 1923. Up to August 19, 1924, served in two experiments and suffered two attacks of blacktongue, the latest of which began August 13, 1924. On a reconditioning diet from August 19 to September 23, 1924.

September 23, 1924: In good condition. Weighs 11.8 kilograms. Begins Milledgeville butterfat diet No 180A. (Table 11.)

October 1: Weighs 11.6 kilograms. Has been eating well. Food consumption has averaged approximately 1,175 grams per day, representing about 59 grams of butterfat, or approximately 5 grams per kilogram of body weight.

November 1: Weighs 11.8 kilograms. Daily food consumption during the past month has averaged approximately 1,380 grams, representing 66 grams of butterfat, or approximately 5.5 grams per kilogram of body weight.

December 1: Weighs 11.5 kilograms. Daily food consumption for November has averaged approximately 1,370 grams, representing about 65 grams of butterfat or approximately 5.5 grams per kilogram of body weight.

December 28: Weighs 10.6 kilograms. Food consumption has gradually diminished. During the past 22 days it has averaged approximately 990 grams,

representing 47 grams of butterfat per day, or slightly over 4 grams per kilogram of body weight.

December 27: This morning, 95 days since the butterfat diet was begun, the mucosa of the floor of the mouth is found very suggestively reddened.

December 28: Mouth appears normal.

January 1, 1925: Food consumption during the past nine days has been much better than during the earlier part of December, averaging approximately 1,380 grams of food, representing 66 grams of butterfat daily.

February 1: Weighs 10.9 kilograms. The daily food consumption during January has averaged approximately 1,430 grams, representing about 68 grams of butterfat, or fully 6 grams per kilogram of body weight

March 1: Weighs 10.9 kilograms. During the past month the daily food consumption has averaged approximately 1,300 grams, representing about 62 grams of butterfat.

April 1: Weighs 10.7 kilograms. During March the daily food consumption has averaged approximately 1,380 grams, representing 66 grams of butterfat, or approximately 6 grams per kilogram of body weight.

May 1: During April the daily food consumption averaged approximately 1,500 grams, representing 72 grams of butterfat.

May 26: Weighs 12.2 kilograms. Since the beginning of this month the daily food consumption has averaged approximately 1,470 grams, representing about 71 grams of butterfat, or fully 5.5 grams per kilogram of body weight. There has been no evidence suggesting blacktongue since the evanescent reddening of the mucosa of the floor of the mouth noted December 27, 1924, five months ago. Begins this day Vermont butterfat diet No. 180C, the composition of which is shown in Table 11.

June 1: The daily food consumption since the change in diet has averaged approximately 1,200 grams, representing about 57 grams of Vermont butterfat.

July 1: Weighs 12 kilograms. Food consumption during June has averaged approximately 1,170 grams, representing about 56 grams of butterfat per day, or fully 4.5 grams per kilogram of body weight.

July 17: Three days ago weighed 12 kilograms. Daily food consumption since the beginning of this month has averaged approximately 1,050 grams, representing 50 grams of butterfat, or approximately 4 grams of butterfat per kilogram of body weight.

Presents this day—52 days since beginning the Vermont butterfat diet—a suggestive reddening of the floor of the mouth. A reconditioning diet is begun this day.

July 18: The injection of the floor of the mouth has faded. Further history not relevant.

Dog 66.—Male. Whelped in the laboratory November 25, 1923. Reared on stock diets. Between April 22 and June 9, 1924, served in one experiment without any manifestations of blacktongue. On stock diet between June 9, 1924, and September 23, 1924.

September 23, 1924: In good condition. Weighs 10.4 kilograms. Begins Milledgeville butterfat diet No. 180A. (Table 11.)

October 1: Weighs 10.2 kilograms. Since beginning this test has regularly eaten all of the daily allowance of 1,100 grams of food, representing about 53 grams of Milledgeville butterfat, or approximately 5 grams per kilogram of body weight.

October 8: Weighs 10.1 kilograms. Has regularly been eating all of the daily allowance of 1,200 grams of food during the past week.

October 22: Weighs 10.4 kilograms. During the past two weeks the daily food consumption has averaged approximately 1,420 grams, representing 68 grams of butterfat, or fully 6 grams per kilogram of body weight.

November 4: Weighs 11 kilograms. During the past two weeks has been regularly consuming all of the daily allowance of 1,700 grams of food, representing about 82 grams of butterfat, or almost 7.5 grams per kilogram of body weight.

November 11: Weighs 11 kilograms. During the past week the food consumption has averaged approximately 1,680 grams a day, representing 81 grams of butterfat, or fully 7 grams per kilogram of body weight. The mucosa of the floor of the mouth is this morning, 49 days since beginning the Milledgeville butterfat diet, suggestively reddened.

November 12: Injection of the floor of the mouth about as yesterday.

November 14: Injection of the floor of the mouth has become much reduced.

November 16: The mucosa of the floor of the mouth is normal in appearance this morning. During the past five days the appetite appears to have been slightly dulled, the daily food consumption averaging approximately 1,340 grams, representing 64 grams of butterfat.

December 2: Weighs 11 kilograms. During the past 16 days the food consumption has averaged approximately 1,570 grams, representing 75 grams of butterfat, or slightly short of 7 grams per kilogram of body weight.

January 6, 1925: Weighs 11.4 kilograms. During the past five weeks the daily food consumption has averaged approximately 1,510 grams, representing 72 grams of butterfat, or fully 6 grams per kilogram of body weight.

February 3: Weighs 10.7 kilograms. During the past four weeks the daily food consumption has been somewhat diminished, averaging approximately 1,450 grams per day.

March 3: Weighs 10.5 kilograms. During the past four weeks the daily food consumption has averaged approximately 1,440 grams, representing 69 grams of butterfat, or nearly 6.5 grams per kilogram of body weight.

March 5: Since the subsidence of the suggestive reddening of the mucosa of the floor of the mouth—first noted on November 11, 1924, four months ago—this animal has presented no buccal lesions suggestive of blacktongue until this morning. This morning, 163 days since beginning the test, there is again present a suggestive injection of the mucosa of the floor of the mouth.

March 7: Floor of mouth continues suggestively reddened.

March 8: Mouth again appears normal.

March 10: Weighs 10.9 kilograms. During the past week has regularly eaten the daily allowance of 1,700 grams of food, representing approximately 82 grams of butterfat, or fully 7 grams per kilogram of body weight.

March 26: Mucosa of floor of mouth again slightly but suggestively reddened.

March 27: Mouth again normal.

April 7: Weighs 10.5 kilograms. During the past four weeks the daily food consumption has averaged approximately 1,310 grams, representing 63 grams of butterfat, or approximately 6 grams per kilogram of body weight.

May 26: Weighs 11 kilograms. During the past seven weeks the daily food consumption has averaged approximately 1,475 grams, representing 71 grams of butterfat. Has presented nothing suggesting blacktongue since the evanescent injection of the floor of the mouth noted March 26. Begins this day Vermont butterfat diet No. 180C. (Table 11.)

June 11: Two days ago weighed 10.8 kilograms. Food consumption during the past 16 days has been somewhat diminished, averaging approximately 1,190 grams a day, which represents 57 grams of Vermont butterfat, or fully 5 grams of butterfat per kilogram of body weight.

Presents this morning, 16 days after beginning the Vermont butterfat diet and 261 days since beginning the test, definite buccal signs of an attack of blacktongue, a well-marked reddened patch on the mucosa of the upper lip opposite the canines on both sides, slight reddening of the mucosa of the cheeks and marked reddening of the floor of the mouth. Further history not relevant.

Dog 78.—Bitch. Acquired March 19, 1924. Up to August 18, 1924, served in one experiment. Presented evanescent signs suggesting blacktongue on July 12, 1924. From August 19 to September 23, 1924, on reconditioning diets.

September 23, 1924: In good condition. Weighs 10.4 kilograms. Begins Milledgeville butterfat diet No. 180A. (Table 11.)

October 21: Weighs 9.7 kilograms. Daily food consumption during the past four weeks has averaged approximately 660 grams, representing 32 grams of Milledgeville butterfat, or fully 3 grams per kilogram of body weight.

November 18: Weighs 9.6 kilograms. During the past four weeks the daily food consumption has averaged 610 grams, representing 29 grams of butterfat, or approximately 3 grams per kilogram of body weight.

December 16: Weighs 9.4 kilograms. During the past four weeks the daily food consumption has averaged approximately 750 grams, representing 36 grams of butterfat, or fully 3.5 grams per kilogram of body weight.

January 13, 1925: Weighs 9.6 kilograms. During the past four weeks the daily food consumption has averaged approximately 730 grams, representing 35 grams of butterfat, or fully 3.5 grams per kilogram of body weight.

March 10: Weighs 10.7 kilograms. During the past eight weeks the daily food consumption has averaged approximately 680 grams, representing 33 grams of butterfat, or approximately 3 grams per kilogram of body weight.

April 7: Weighs 9.4 kilograms. Appetite has for some time been increasingly variable and, in general, considerably diminished. During the past four weeks the daily food consumption has averaged approximately 460 grams, representing 22 grams of butterfat, or fully 2 grams per kilogram of body weight.

May 26: Weighs 9.8 kilograms. During the past seven weeks appetite has in general been better. The daily food consumption for this period has averaged approximately 720 grams, representing 35 grams of Milledgeville butterfat, or approximately 3.5 grams per kilogram of body weight. Begins Vermont butterfat diet No. 180C. (Table 11.)

June 23: Weighs 10 kilograms. During the past four weeks the daily food consumption has averaged approximately 690 grams, representing 33 grams of Vermont butterfat or fully 3 grams per kilogram of body weight.

July 7: Weighs 9.7 kilograms. During the past two weeks the daily food consumption has averaged approximately 600 grams, representing 29 grams of butterfat, or approximately 3 grams per kilogram of body weight.

July 11: The mucosa of the floor of the mouth presents a very suggestively reddened area at about its center this morning—46 days after beginning the Vermont butterfat diet, and 291 days after beginning the Milledgeville butterfat diet.

July 13: The injection noted day before yesterday has faded. Weighs 9.8 kilograms.

July 17: Food consumption during the past 10 days has averaged approximately 640 grams, representing 31 grams of butterfat, or fully 3 grams per kilogram of body weight. The feeding with the butterfat diet is this day discontinued. During the period of 297 days of the butterfat feeding this animal presented the suggestive but very evanescent indications of blacktongue noted July 11, 1925.

Result.—We find, then, that each of the four test animals developed some evidence of blacktongue which was definitely marked in two, dogs 9 and 66, but was not more than strongly suggestive in each of the other two. The amount of butterfat ingested daily varied with each animal and in the same animal at different times in accordance with variations in appetite during the progress of the feeding. The daily rate at its highest varied among the dogs between 3.5 and 7 grams per kilogram of body weight for the Milledgeville butterfat and between 3 and 5 grams for the Vermont product. It is notable that the highest rate of consumption was in one of the dogs (dog 66) that developed a definitely recognizable attack of blacktongue.

EXPERIMENT 12

This was a preventive test of the Vermont butterfat and was carried out in four animals, dogs 52, 60, 63, and 64. The butter was about 3 months old when the feeding of the first three of these animals began and about 7 months old when the feeding of the fourth began. The butterfat was incorporated in two diets—No. 180B (Table 11) and No. 180C (Table 11), respectively. These diets were offered separately in immediately succeeding periods to each of three of the test dogs (dogs 52, 60, and 64). In the fourth animal (dog 63) the feeding comprised but a single period and was with diet No. 180B. These diets differed in but one respect, namely, that No. 180C contained no tomato juice. The elimination of tomato juice from the diet was decided upon when certain other of our studies indicated what had not been suspected theretofore—that tomato juice might itself possess preventive action and thus by its inclusion, even in small amounts, tend to affect the result of the feeding. The significant details relating to each of the test dogs are briefly presented in the following:

Dog 52.—Bitch. Acquired September 25, 1923. Has served in several experiments and has suffered three attacks of blacktongue, the latest of which began July 31, 1924. On reconditioning diets from August 19 to October 15, 1924.

October 15, 1924: In good condition. Weighs 9.8 kilograms. Begins Vermont butterfat diet No. 180B. (Table 11.)

October 28: Weighs 9.8 kilograms. Has regularly consumed the daily offering of 1,000 grams of food, representing 48 grams of Vermont butterfat, or slightly less than 5 grams per kilogram of body weight.

November 25: Weighs 10.4 kilograms. Appetite continues excellent. Only once during the past four weeks was any (about 50 grams) of the daily allowance of 1,000 grams left uneaten.

February 10, 1925: Appetite continued excellent throughout the past 11 weeks. Only twice during this period was any (490 grams and 150 grams, respectively) of the daily allowance of 1,000 grams left uneaten. Weight has gradually risen and is 11.5 kilograms to-day.

February 24: Weighs 11.4 kilograms. During the past two weeks appetite has been variable and the food consumption was diminished, averaging approximately 700 grams, representing 34 grams of butterfat, daily.

March 24: Appetite has continued variable and became further dulled during the past four weeks, the daily food consumption averaging approximately 540 grams, representing 26 grams of butterfat. Weighs 9.9 kilograms.

Presents this morning, 157 days since beginning the Vermont butterfat diet, the first signs of blacktongue, a streaky reddening of the mucosa of the floor of the mouth.

March 25: The reddening of the mucosa of the floor of the mouth is more extensive and more vivid.

March 26: The reddening of the floor of the mouth persists.

March 27: The mouth lesion has completely faded.

March 31: Weighs 10.3 kilograms. During the past four days the appetite has been excellent, the animal regularly eating all of the daily allowance of 1,000 grams of food, representing 48 grams of butterfat, or approximately 4.5 grams of butterfat per kilogram of body weight.

April 14: During the past two weeks has regularly eaten all of the daily allowance of 1,000 grams of food. Weighs 10.6 kilograms.

April 28: Left some of the daily allowance of food four times during the past two weeks so that the daily food consumption has averaged 860 grams, representing 41 grams of butterfat. Weighs 10.5 kilograms.

May 12: During the past two weeks food consumption again was excellent, the daily allowance of 1,000 grams of food, representing 48 grams of butterfat, being regularly consumed. Weighs 10.6 kilograms.

May 26: Appetite variable during past two weeks. Daily food consumption has averaged approximately 830 grams, representing 40 grams of butterfat. Weighs 10.3 kilograms. Begins to-day Vermont butterfat diet 180C, thus excluding tomato juice from the ration.

June 23: Weighs 10.2 kilograms. During the past four weeks the daily food consumption has averaged approximately 930 grams, representing 45 grams of butterfat, or approximately 4.5 grams of butterfat per kilogram of body weight.

July 7: Daily food consumption during the past two weeks has averaged approximately 780 grams, representing 37 grams of butterfat. Weighs 10.3 kilograms.

July 17: During the past 10 days the daily food consumption has averaged approximately 900 grams, representing 43 grams of butterfat. Three days ago weighed 10.2 kilograms. Is in good condition. The butterfat feeding is discontinued this day, 275 days after it began. During this period transient buccal signs of blacktongue were in evidence between March 24 and March 27.

Dog 60.—Male. Whelped in the laboratory November 4, 1923. Reared and maintained on stock diets up to October 15, 1924.

October 15, 1924: In good condition. Weighs 6.5 kilograms. Begins Vermont butterfat diet No. 180B.

December 16: Weighs 7.7 kilograms. Appetite has been excellent. Has regularly consumed all of the daily allowance of 1,100 grams of food, representing approximately 53 grams of butterfat, or fully 6.5 grams per kilogram of body weight.

December 30: During the past two weeks has twice left a little (220 grams and 140 grams, respectively) of the daily allowance of 1,100 grams of food. Weighs 7.8 kilograms.

January 13, 1925: Appetite has been quite variable and food consumption somewhat reduced during the past two weeks. The daily food consumption has

averaged approximately 820 grams. representing 39 grams of butterfat. Weighs 7.3 kilograms.

January 17: Presents a desquamative lesion of the skin of the scrotum; it was first observed about two weeks ago.

February 10: During the past four weeks the daily food consumption has averaged approximately 1,020 grams, representing 50 grams of butterfat. Weighs 7.4 kilograms.

February 28: Scrotal lesion persists and has become somewhat more extensive.

March 10: During the past four weeks the daily food consumption has averaged approximately 970 grams, representing 47 grams of butterfat. Weighs 7.5 kilograms.

March 24. Desquamation of skin of scrotum persists.

April 7: During the past four weeks the appetite has continued to be variable. The daily food consumption has averaged approximately 830 grams, representing 40 grams of butterfat. Weighs 7.1 kilograms.

May 26: During the past seven weeks the appetite continued variable. The daily food consumption has averaged approximately 880 grams, representing 42 grams of butterfat. Weighs 7 kilograms. Begins this day Vermont butterfat diet No. 180C.

June 23: Appetite has diminished further during the past four weeks, the daily food consumption averaging approximately 730 grams, representing 35 grams of butterfat. Weighs 6.8 kilograms.

July 14: During the past three weeks the daily food consumption became further reduced, averaging but 510 grams, which represent 24 grams of butterfat. Weighs 6.4 kilograms. Presents this morning, 49 days since the modification in diet eliminating tomato juice, and 272 days since the beginning of the butterfat diet, the first buccal signs of an attack of blacktongue, erythematous bandlike lesions on the mucosa of the upper lip. The scrotum shows some ragged tabs of epidermal flakes marking the periphery of the lesion that has persisted in variable degree for about six months. Further history not relevant.

Dog 63.—Male. Whelped in the laboratory November 4, 1923. Has served in one experiment and suffered an attack of blacktongue, which began June 2, 1924. On reconditioning diets from June 3 to October 15, 1924.

October 15, 1924: In good condition. Weighs 7 kilograms. Begins Vermont butterfat diet No. 180B.

December 30: Weighs 8 kilograms. Appetite has been uniformly excellent. Has regularly consumed the daily allowance of 1,200 grams of food, representing approximately 58 grams of the Vermont butterfat, or fully 7 grams per kilogram of body weight.

February 24, 1925: During the past two months the appetite has been variable and the food consumption has been somewhat diminished, averaging approximately 1,040 grams a day which represents approximately 50 grams of butterfat. Weighs 7.4 kilograms.

February 28: Has for some time presented an ill-defined, mealy sort of desquamation of the skin of the scrotum. It is now more marked and involves nearly all of the ventral aspect of the scrotum, which is also reddened.

March 5: The scrotal lesion has persisted. In addition there are present this morning, 141 days since beginning the butterfat diet, the first buccal signs of an attack of blacktongue, a slight reddening of the mucosa of the floor of the mouth. Appetite during the past nine days has been fairly good. The daily food consumption has averaged 1,110 grams, representing 53 grams of butterfat. Further history not relevant.

Dog 64.—Bitch. Whelped in the laboratory November 4, 1923. On stock diets to February 28, 1925.

February 28, 1925: In good condition. Weighs 6.8 kilograms. Begins Vermont butterfat diet No. 180B.

March 17: Weighs 6.8 kilograms. Appetite has been excellent. Has regularly consumed all of the daily allowance of 1,000 grams of food, representing approximately 48 grams of the Vermont butterfat, or at a rate of approximately 7 grams of butterfat per kilogram of body weight.

March 31: During the past two weeks the daily food consumption was slightly reduced, averaging approximately 870 grams representing 42 grams of butterfat. Weighs 6.7 kilograms.

May 26: During the past eight weeks the appetite has been variable; the daily food consumption has averaged approximately 860 grams, which represents 41 grams of butterfat. Weighs 6.8 kilograms.

Begins to-day Vermont butterfat diet No. 180C, thus excluding tomato juice from the ration.

June 23: During the past four weeks the appetite has become increasingly capricious. The daily food consumption has averaged approximately 710 grams, representing 34 grams of butterfat.

June 27: Presents this morning, 32 days since beginning the butterfat diet without tomato juice, and 114 days since beginning the test of Vermont butterfat, a suggestive injection of the mucosa of the floor of the mouth.

June 28: The reddening of the floor of the mouth has faded out.

July 14: During the past three weeks the appetite continued capricious. The daily food consumption has averaged 770 grams, representing 37 grams of butterfat. Weighs 6.9 kilograms.

July 17: Animal is in good condition. Has presented no further evidence suggestive of blacktongue since the evanescent injection of the floor of the mouth noted three weeks ago. Experiment is discontinued at the end of an observation period of 139 days for this animal.

Results and conclusions.—Thus it appears that all four test dogs developed some evidence of blacktongue. This was of such a character in three of the animals as to permit of a definite diagnosis in them, but was too slight in the fourth (dog 64) to be more than suggestive. It should, perhaps, be noted that in the latter animal the experimental period was relatively short—139 days—so that the possibility is not excluded that more definite evidence would have appeared if that period had been longer. In the three animals with definitely recognizable attacks, these attacks began at the end of 157, 272, and 141 days, respectively. It is pertinent to note that the consumption of the experimental diets was such as to represent during certain high periods an ingestion of butterfat that varied among the dogs between 5 and 7 grams per kilogram of body weight.

Turning now to a consideration of the results of the experiment with butter (including butterfat) as a whole, we find that in the three animals (dogs 47, 17, and 29) in which it was tested by the curative procedure, no beneficial effect was recognized, although in each instance treatment was begun under very favorable conditions and with, in effect, very large doses of a then recently prepared (Beltsville) butter. In the preventive tests 12 dogs were used; all developed some evidence of blacktongue, but this was slight, at most only sugges-

tive, in three, or 25 per cent of them. In those in which a definite attack was recognizable, this began in all but one (dog 47) at the end of unusually long periods. This delay in the onset, coupled with the large proportion of animals presenting but slight and uncertain evidence of an attack, suggests that the butter (including the butterfat) had an appreciable preventive action. Considered in relation to dosage, that is, in relation to the quantities of butter ingested per kilogram of body weight of dog, the preventive potency of the butter would seem to have been of a rather feeble order. This appears, perhaps, more clearly if one considers that the average human adult male would have to ingest upward of 350 grams of butterfat a day to equal relatively the average amount ingested by some of the dogs. Even allowing for the relatively smaller requirement by the human, which, as suggested by our experience with milk (see preceding section), would appear to be about one-half that of the dog when related to body weight, the amount of butterfat that would have to be ingested by the average human adult male for complete protection would have to exceed 175 grams per day. It would seem permissible to conclude, therefore, that, while not devoid of it, butter is a relatively very poor source of the blacktongue preventive, a conclusion that, as above already remarked, is in harmony with the experience with butter in human pellagra.

COD-LIVER OIL

The well-known richness of cod-liver oil in certain vitamins very early suggested the desirability of investigating it as a possible source of the blacktongue preventive. Tests of the curative and preventive action of cod-liver oil were therefore undertaken concurrently with some of our earlier tests of butter.

The cod-liver oil used in this study was some of the same supply as that tested in pellagra prevention by Goldberger and Tanner (11) at the Georgia State Sanitarium, and by them found ineffective when ingested by their patients at a daily rate of 2 grams per kilogram of body weight. It may be noted that when tested in rats this cod-liver oil was found to be rich in vitamin A (unpublished data).

Curative tests with this oil in four dogs with blacktongue with a daily dosage of 2 grams per kilogram of body weight failed in every instance to effect any appreciable beneficial result. Since interpretation of the preventive test is beset with fewer difficulties than the curative, and can therefore be made with greater confidence of its soundness, we carried out the following experiment:

EXPERIMENT 13

This was a test of the blacktongue preventive action of the beforementioned cod-liver oil. The oil was incorporated in a diet, No. 114, the composition of which is shown in Table 9, and suitable calorie

portions were offered daily to each of three test animals—dogs 17, 29, and 48. The significant details relating to each of these dogs are as follows:

Dog 17.—Bitch. Acquired April 14, 1923. Up to August 10, 1923, served in one experiment and suffered an attack of blacktongue, which began July 3, 1923. On a stock diet from August 10 to September 11, 1923.

September 11, 1923: In good condition. Weighs 11.1 kilograms; begins test diet No. 114. (Table 9.)

September 18: Weighs 11 kilograms. Daily food consumption during the week since beginning the test has averaged approximately 875 grams, representing 56 grams of cod-liver oil, or approximately 5 grams of the oil per kilogram of body weight.

September 25: Weighs 10.7 kilograms. Daily food consumption during the past week has averaged approximately 895 grams, representing 57 grams of cod-liver oil, or fully 5 grams of the oil per kilogram of body weight.

October 2: Weighs 10.3 kilograms. Appetite has fallen off. The daily food consumption during the past week has averaged approximately 700 grams, representing 45 grams of cod-liver oil, or fully 4 grams per kilogram of body weight.

October 9: Weighs 10.2 kilograms. The daily food consumption during the past week has averaged approximately 655 grams, representing 42 grams of cod-liver oil, or 4 grams of oil per kilogram of body weight.

Presents this morning, at the end of a period of 21 days, the first signs of an attack of blacktongue, an injection of the floor of the mouth and reddening of the anterior faucial pillars. Further history not relevant.

Dog 29.—Male Acquired May 9, 1923. Up to July 27, 1923, served in one experiment and suffered an attack of blacktongue, which began July 23, 1923. On a stock diet from July 27 to September 11, 1923.

September 11, 1923: In good condition; weighs 11 kilograms; begins diet No. 114.

September 18: Weighs 10.5 kilograms. Daily food consumption during the week since beginning the cod-liver diet has averaged approximately 650 grams, representing 42 grams of cod-liver oil, or approximately 4 grams of oil per kilogram of body weight.

September 25: Weighs 10.4 kilograms. Daily food consumption during the past week has averaged approximately 605 grams, representing 38 grams of cod-liver oil, or fully 3.5 grams per kilogram of body weight.

September 30: Presents this morning, at the end of a period of 19 days, the first evidence of an attack of blacktongue, an injection of the floor of the mouth. Further history not relevant.

Dog 48.—Bitch. Acquired August 20, 1923. On stock diet to September 11, 1923.

September 11, 1923: In good condition. Weighs 5.9 kilograms. Begins test diet No. 114.

October 2: Weighs 5.5 kilograms. The daily food consumption during the three weeks since beginning this test has averaged approximately 565 grams, representing 36 grams of cod-liver oil, or fully 6 grams of the oil per kilogram of body weight.

October 30: Weighs 5.7 kilograms. Daily average food consumption during the past four weeks has been approximately 625 grams, representing 40 grams of cod-liver oil, or approximately 7 grams of the oil per kilogram of body weight.

November 6: Weighs 5.4 kilograms. Presents this morning, 56 days after beginning the test diet, the first evidence of an attack of blacktongue, an injection of the floor of the mouth.

Result and conclusion.—All three test animals developed blacktongue, the first signs of which appeared at the end of 21, 19, and 56 days, respectively, notwithstanding the daily ingestion of the cod-liver oil which, during certain periods, averaged 5, 4, and 7 grams per kilogram of body weight of the respective animals. This result is in harmony with the indications of our curative trials and indicates that cod-liver oil contains little, if any, of the blacktongue preventive. It is in harmony also, it may be noted, with the results of the tests of this cod-liver oil in the human disease, so that cod-liver oil would seem to be poor in or lacking the preventive for both blacktongue and pellagra.

COTTONSEED OIL

The importance of cottonseed oil among the edible oils suggested the desirability of an inquiry into its blacktongue-preventive potency. The following experiment was accordingly carried out:

EXPERIMENT 14

The cottonseed oil [1] to be tested was incorporated in a diet, No. 302, the composition of which is shown in Table 12, and a suitable caloric portion of this was offered daily to each of six test animals, dogs 29, 50, 54, 110, 122, and 123. The significant details relating to each of the animals are as follows:

Dog 29.—Male. Acquired May 10, 1923. Has suffered several attacks of experimental blacktongue, the latest of which began September 17, 1927. On stock diet for reconditioning from September 27 to November 23, 1927.

November 23, 1927: In good condition; weighs 9.7 kilograms; begins test diet No. 302.

December 6: Weighs 10.2 kilograms. Has been eating well, regularly consuming the daily allowance of 1,000 grams of food, representing 46 grams of the cottonseed oil, or nearly 4.5 grams of the oil per kilogram of body weight.

December 9: Has continued to eat all food offered daily. Presents this morning, 17 days after starting the test, the first signs of an attack of blacktongue, a reddening of the mucosa of the floor of the mouth and of that of the upper lip on the left side. Progressive attack. Died December 19.

Dog 50.—Male. Acquired September 25, 1923. Up to May 25, 1927, served in various experiments and suffered several attacks of blacktongue, the latest of which began about May 8, 1927. On stock diet from May 25 to September 7, 1927.

September 7, 1927: In good condition; weighs 14.2 kilograms; begins test diet No. 302.

September 13: Weighs 14 kilograms. Daily food consumption since beginning the test diet has averaged approximately 740 grams, representing 34 grams of the cottonseed oil, or slightly short of 2.5 grams per kilogram of body weight.

[1] A commercial preparation marketed for domestic use under the name of Wesson Oil.

September 20: Weighs 14.2 kilograms. During the past week the daily food consumption has averaged approximately 850 grams, representing 39 grams of the oil, or fully 2.5 grams per kilogram of body weight.

September 27: Weighs 14 kilograms. Average daily food consumption during the past week has been approximately 880 grams representing 40 grams of the oil or a little over 2.5 grams per kilogram of body weight. Presents this morning, 20 days after beginning the test diet, the first signs of an attack of blacktongue, a sharply delimited red band on the mucosa of the upper lip of each side, reddening of the mucosa of the floor, cheeks, and fauces. Further history not relevant.

Dog 54.—Bitch. Acquired September 25, 1923. Up to September 7, 1927, served in several experiments and suffered a number of attacks of blacktongue, of which mild, evanescent evidence of the latest was present between August 4 and August 9, 1927. On stock diet from September 7 to October 12, 1927.

October 12, 1927: In good condition; weighs 9.7 kilograms; begins test diet No. 302.

October 18: Weighs 9.3 kilograms. Daily food consumption since beginning the test diet has averaged approximately 840 grams, representing 38 grams of the cottonseed oil or fully 4 grams per kilogram of body weight.

October 25: Weighs 9.6 kilograms. During the past week has regularly consumed the daily allowance of 900 grams of food, representing 41 grams of the oil, or fully 4 grams per kilogram of body weight.

November 8: Weighs 8.9 kilograms. Appetite much dulled during the past two weeks. Daily food consumption during this period has averaged approximately 380 grams, representing 22 grams of the oil or fully 2 grams per kilogram of body weight.

November 12: Presents this morning, 31 days after beginning the test, the first signs of an attack of blacktongue, a reddened patch of mucosa of the upper lip on each side and an injection of the floor of the mouth. Further history not relevant.

Dog 110.—Bitch. Acquired October 29, 1926. Up to September 7, 1927, served in one experiment but developed no evidence of blacktongue. On stock diet from September 7 to October 12, 1927.

October 12, 1927: In good condition; weighs 12.7 kilograms; begins test diet No. 302.

October 18: Weighs 12.6 kilograms. Since beginning the test diet daily food consumption has averaged approximately 940 grams, representing 43 grams of the oil, or a little short of 3.5 grams per kilogram of body weight.

October 25: Weighs 12.7 kilograms. During the past week has regularly consumed the daily allowance of 1,000 grams of food, representing 46 grams of the oil, or fully 3.5 grams per kilgoram of body weight.

November 1: Weighs 12.5 kilograms. Appetite has become somewhat dulled. Daily food consumption during the past week has averaged approximately 760 grams, representing 35 grams of the oil, or fully 2.5 grams per kilogram of body weight.

November 15: Weighs 12.3 kilograms. Daily food consumption during the past two weeks has averaged approximately 690 grams, representing 32 grams of the oil, or fully 2.5 grams per kilogram of body weight.

November 19: Presents this morning, 38 days after beginning the test, the first evidence of an attack of blacktongue, an injection of the floor of the mouth. Further history not relevant.

Dog 122.—Bitch. Acquired May 11, 1927. On stock diet to September 7, 1927.

September 7, 1927: In good condition; weighs 8.1 kilograms; begins test diet No. 302.

September 13: Weighs 7.9 kilograms. Daily food consumption since beginning of test has averaged approximately 720 grams, representing 33 grams of the oil, or fully 4 grams per kilogram of body weight.

September 20: Weighs 7.9 kilograms. Daily food consumption during the past week has averaged approximately 755 grams, representing 34 grams of the oil, or slightly over 4 grams per kilogram of body weight.

September 27: Weighs 7.9 kilograms. Daily food consumption during the past week has averaged approximately 720 grams of food, representing 33 grams of the oil, or fully 4 grams per kilogram of body weight. Presents this morning, 20 days after beginning the test, the first evidence of blacktongue, an injection of the floor of the mouth. Further history not relevant.

Dog 123.—Bitch. Acquired May 11, 1927. On our stock diet No. 156 up to September 7. Threw a litter of seven pups June 29, which were successfully nursed and were weaned in good condition on August 9.

September 7, 1927: In good condition; weighs 7.8 kilograms; begins test diet No. 302.

September 13: Weighs 7.5 kilograms. Daily food consumption since beginning the test has averaged approximately 800 grams, representing 37 grams of the oil, or but little short of 5 grams per kilogram of body weight.

September 20: Weighs 7.3 kilograms. Food consumption during the past week has averaged approximately 610 grams, representing 28 grams of the oil, or fully 3.5 grams per kilogram of body weight.

October 4: Weighs 6.9 kilograms. Appetite has been dulled. Food consumption during the past two weeks has averaged approximately 470 grams, representing 22 grams of the oil, or fully 3 grams per kilogram of body weight.

Presents this morning, 27 days since beginning the test, the first evidence of blacktongue, an injection of the mucosa of the floor of the mouth.

Result and conclusion.—As appears in the foregoing, the high levels of food consumption among the test animals represented a consumption of fully 2.5 grams of the cottonseed oil per kilogram of body weight in one of them (dog 50), fully 3.5 grams in two (dogs 110 and 123), fully 4 grams in two (dogs 54 and 122), and nearly 4.5 grams in one (dog 29). Notwithstanding this, however, all six of the dogs developed blacktongue, the first buccal signs of which appeared at the end of periods of from 17 to 38 days. It would seem, therefore, that the test diet was without appreciable preventive action and, thus, that the cottonseed oil contained little, if any, of the blacktongue preventive.

No specific study of the effectiveness of cottonseed oil in pellagra has been made. Judged on the basis of general experience it seems unlikely that this oil contains the pellagra preventive in significant amounts.

LEAN BEEF

Very early in our study of experimental blacktongue, occasion arose for testing the curative value of fresh beef muscle, a food that there was reason to believe contained (10) (11), and later was demonstrated to contain, a good supply of the pellagra preventive (1). Since then we have repeatedly used fresh beef as a therapeutic agent. Our experience has been consistently favorable. We shall not detail

any of this, however, preferring instead to present the results of two experiments in which the more convincing preventive test of this food was carried out.

EXPERIMENT 15

This was a test of the blacktongue preventive action of fresh lean beef. Fresh round steak was first carefully trimmed free of gristle, tendon and visible fat, run through a meat chopper, and then incorporated in diet No. 196, the composition of which is shown in Table 13. This diet is essentially our basic blacktongue-producing diet No. 123 (Table 1), the casein of which has been replaced by a quantity of fresh lean beef calculated to yield the same amount of protein as does the casein. Of this diet suitable caloric portions were daily offered to each of five test animals, dogs 42, 62, 68, 69, and 76. The significant details relating to each animal are briefly as follows:

Dog. 42.—Male. Acquired June 26, 1923. Up to June 24, 1924, served in several experiments and suffered three attacks of blacktongue, the latest of which began April 2, 1924. In a test of yeast from June 24, 1924, to May 26, 1925, without presenting any evidence of blacktongue.

May 26, 1925: In good condition. Weighs 11.7 kilograms. Begins test diet No. 196.

May 26, 1926: Has been on diet No. 196 for one year. Weighs 13 kilograms. Is now and has throughout the year been in good condition and without any recognizable indications of blacktongue.

Dog 62.—Male. Whelped in the laboratory November 4, 1923. Reared and maintained on stock diets until June 24, 1924. In a test of yeast from June 24, 1924, to May 26, 1925, during which presented transient evidence of blacktongue March 24, 1925.

May 26, 1925: In good condition. Weighs 7.9 kilograms. Begins diet No. 196.

May 26, 1926: Completes one year on diet No. 196. Weighs 8.8 kilograms. Has presented no indications of blacktongue at any time during the year.

Dog 68.—Bitch. Whelped in the laboratory November 25, 1923. Reared and maintained on stock diets until June 24, 1924. In a test of yeast from June 24, 1924, to May 26, 1925, during which presented evanescent indications of blacktongue September 27, 1924.

May 26, 1925: In good condition. Weighs 8.1 kilograms. Begins diet No. 196.

May 26, 1926: Completes one year on diet No. 196. Weighs 9.6 kilograms. Has presented no evidence of blacktongue during the year.

Dog 69.—Male. Whelped in the laboratory November 5, 1923. Reared and maintained on stock diets until June 24, 1924. In a test of yeast from June 24, 1924, to May 26, 1925, during which presented no evidence of blacktongue.

May 26, 1925: In good condition. Weighs 8.3 kilograms. Begins test diet No. 196.

May 26, 1926: Completes one year on diet No. 196 Weighs 9.1 kilograms. Has presented no evidence of blacktongue during the year.

Dog 76.—Male. Acquired June 9, 1924. In a test of yeast from June 24, 1924, to May 26, 1925, during which presented no evidence of blacktongue.

May 26, 1925: In good condition. Weighs 9.2 kilograms. Begins diet No. 196.

May 26, 1926: Completes a year on diet No. 196 without having presented any signs of blacktongue. Weighs 10.1 kilograms.

Result and conclusion.—It appears from the foregoing that none of the five test animals presented any recognizable evidence of blacktongue during the experimental period of one year. Clearly, the fresh lean beef furnished enough, and possibly more than enough, of the blacktongue preventive for the complete protection of these animals during the specified experimental observation period.

EXPERIMENT 16

This was also a test of the blacktongue-preventive action of lean beef, but differed from the preceding experiment, first, in that the lean beef was dried and, second, that during the second of the two feeding periods of which the experiment consisted, the dried beef was boiled for about one and one-half hours with certain of the other ingredients of the test diet. During the first feeding period diet No. 196A (Table 13) was used, and during the second, diet No. 196B (Table 13). These were identical diets excepting only that in No. 196A the dried beef was stirred into the cooked food, while in No. 196B the dried beef was cooked as already mentioned. These diets, like diet No. 196, were essentially our basic blacktongue-producing diet No. 123, the casein of which was completely replaced by lean beef which, in this instance, however, was first dried.

The dried beef was prepared by taking the fresh chopped beef of the preceding experiment and first drying it at room temperature under the electric fan, then grinding coarsely, and finally drying (for about 18 hours) in a current of warm air. Thus dried, it was finely ground and stored ready for use. Fresh batches were prepared from time to time as needed.

The test animals were five dogs, numbered 41, 89, 90, 98, and 99, to each of which the test diet was offered in suitable caloric portions. The significant details relating to each of the animals are as follows:

Dog 41.—Bitch. Whelped in the laboratory June 26, 1923. Up to March 11, 1926, served in several experiments and suffered three attacks of blacktongue, the latest of which began March 4, 1925. On stock diet from March 11 to March 30, 1926.

March 30, 1926: In good condition; weighs 10.9 kilograms; begins diet No. 196A.

October 28, 1926: In good condition. Weighs 10.8 kilograms. Diet changed to No. 196B, thus beginning the second period of the experiment.

April 6, 1927: Has been on the dried-beef diets fully one year, during which period has not presented any evidence of blacktongue. Had a mild attack of an infective stomatitis between March 10 and March 15.[1] Is in good condition. Weighs 10.6 kilograms. Experiment discontinued.

Dog 89.—Bitch. Whelped in the laboratory October 12, 1924. Up to March 11, 1926, served in one experiment, but suffered no blacktongue. On stock diet from March 11 to March 30, 1926.

[1] At this time we had an epidemic of this condition among our animals. Dogs in a number of different experiments then in progress were more or less severely attacked. The condition and its differentiation from blacktongue were briefly described in a previous communication (2).

March 30, 1926: In good condition; weighs 4.8 kilograms; begins diet No. 196A.

October 28, 1926: In good condition; weighs 4.7 kilograms; diet is changed to No. 196B.

April 6, 1927: About March 10 developed an infective stomatitis, since when there has been a very marked reduction in food consumption, with a great loss in weight. Weighs 2.8 kilograms. Has presented no recognizable evidence of blacktongue. Experiment is discontinued.

Dog 90.—Male. Whelped in the laboratory October 12, 1924. Up to March 11, 1926, served in one experiment, but did not develop blacktongue. On stock diet from March 11 to March 30, 1926.

March 30, 1926: In good condition; weighs 7.1 kilograms; begins test diet No. 196A.

October 28: In good condition; weighs 6.8 kilograms; diet is changed to No. 196B.

April 6, 1927: Developed a mild infective stomatitis about March 12, with which was associated a reduced food consumption; weighs 6.7 kilograms; is in good condition; has presented no evidence of blacktongue. Experiment is discontinued.

Dog 98.—Male. Acquired January 18, 1926, when about 9 weeks old, at which time weight was 1.6 kilograms. On stock diet until March 30, 1926.

March 30, 1926: In good condition; weighs 4.9 kilograms; begins diet No. 196A.

October 28: In good condition; weighs 6.2 kilograms; diet is changed to No. 196B.

April 6, 1927: Had evidence of a mild infective stomatitis between March 19 and March 25. Is in good condition; weighs 6.6 kilograms. Has presented no evidence of blacktongue. Experiment is discontinued.

Dog 99.—Male. Litter mate of dog 98. Acquired January 18, 1926, when about 9 weeks old, at which time weight was 2.8 kilograms. On stock diet until March 30, 1926.

March 30, 1926: In good condition; weighs 8 kilograms; begins diet No. 196A.

October 28: In good condition; weighs 11.7 kilograms; diet is changed to No. 196B.

February 12, 1927: Taken sick about two weeks ago. Has a bloody nasal discharge, a purulent ophthalmia, and a cough. The dog is gassed. At necropsy there are found patches of consolidation scattered through both lungs. Nature of the infection not determined. No recognizable evidence of blacktongue.

Results and conclusions.—None of the five-test animals presented any recognizable evidence of blacktongue during either dietary period which, together, extended over fully 1 year for four dogs and 10 months for the fifth dog. The latter animal acquired a complicating infection which led to its elimination about two months before the expiration of the year that would normally have constituted the experimental observation period.

Recalling that dogs on basic blacktongue-producing diet No. 123 may be expected to develop the disease at the end of a period only exceptionally longer than about 60 days, it would appear that both the dried beef as such (in diet No. 196A) and the dried beef after boiling one and one-half hours retain much, if not all, of the preventive potency of the fresh beef.

The results of the foregoing experiments with beef muscle clearly indicate that, in relation to the type of basic diet employed, the

quantity used was fully adequate for preventive purposes. How much less would serve equally well we have so far not attempted to determine. It is difficult, or impossible, therefore, to appraise the relative preventive potency of the lean beef; but since the minimum adequate preventive quantity would seem to be not more, and may possibly be somewhat less, than the quantity tested, it is clear that lean beef is a good, if not a rich, source of the blacktongue preventive just as it is of the pellagra preventive, as was noted above.

PORK LIVER

Our study of the blacktongue-preventive action of meat includes, in addition to the test of lean beef detailed in the preceding, one of pork liver which we present in the following experiment:

EXPERIMENT 17

This was a test of the blacktongue-preventive action of dried pork liver. Livers were secured fresh from a local abattoir. Since they were, as a rule, received at the laboratory late in the afternoon, they were stored over night in the laboratory refrigerator room. Next morning, after trimming them as free as possible of ligamentous tissue, they were run through the meat chopper. The livers thus minced were spread out in pans and kept under the electric fan at room temperature, with repeated stirring, until nearly dry. This required some 48–72 hours. They were then again run through the meat chopper, after which the drying was continued and completed in a current of warm air. This final drying took about 18 hours. The liver so dried was then finely ground and stored. Enough was prepared at the beginning of the experiment to supply our requirements during the first seven months of this study. The dried liver used during the last four months of the eleven-month experimental period was prepared in small batches about every two weeks and by a slightly different procedure. In this method the minced fresh livers were heated in a double boiler, without any addition of water, for about 15 minutes to, at least, partially coagulate the protein before being put under the fan to dry. This greatly expedited the drying at air temperature, the duration of which was reduced to some 24–36 hours. The other steps in the procedure were as already described. The dried liver was incorporated in a diet, No. 292, the composition of which is shown in Table 14. By comparison with dried beef diet No. 196B (Table 13), it may be seen that liver diet, No. 292, was essentially identical with this dried beef diet, except that the dried liver quantitatively replaced the dried beef. It may be noted as an additional point of similarity to diet No. 196B that in the preparation of diet No. 292 the dried liver was cooked for about 1½ hours with certain of the other ingredients. By reference to Table 1 it may be

seen further that the dried liver diet was essentially basic diet No. 123, the casein of which was almost completely replaced by dried liver.

Suitable portions of the liver diet were daily offered to each of five test animals, dogs 90, 95, 98, 117, and 118. The significant details relating to each are as follows:

Dog 90.—Male. Whelped in the laboratory October 12, 1924. Up to April 6, 1927, had served in two experiments but had no blacktongue. On stock diet from April 6 to May 12, 1927.

May 12, 1927: In good condition; weighs 7.2 kilograms; begins test diet No. 292.

April 10, 1928: In good condition; weighs 7.2 kilograms. Has presented no recognizable evidence of blacktongue at any time during the experimental period of 11 months.

Dog 95.—Acquired November 30, 1925. Has served in one experiment but has had no blacktongue. On stock diet from March 15 to May 12, 1927.

May 12, 1927: In good condition; weighs 8.2 kilograms; begins diet No. 292.

April 10, 1928: In good condition; weighs 9.1 kilograms. Has presented no recognizable evidence of blacktongue during the observation period of 11 months.

Dog 98.—Male. Acquired January 18, 1926. Has served in one experiment but has not had blacktongue. On stock diet from April 6 to May 12, 1927.

May 12, 1927: In good condition; weighs 6.5 kilograms; begins liver diet No. 292.

April 10, 1928: Weighs 7.1 kilograms; in good condition. Has presented no recognizable evidence of blacktongue at any time during the experimental period of 11 months.

Dog 117.—Bitch. Acquired April 9, 1927. On stock diet to May 12, 1927.

May 12, 1927: In good condition; weighs 7.8 kilograms; begins diet No. 292.

April 10, 1928: Appetite and food consumption have been consistently good throughout since the beginning of the experiment 11 months ago. Gained in weight during the first three months. Then during the succeeding seven months, that is, until about the end of February, 1928, the weight oscillated between 9 and 9.5 kilograms. Since early in March, although the food consumption has continued excellent, weight has slowly declined, reaching 8.5 kilograms on April 3. To-day weighs 9.3 kilograms, this gain being coincident with an increase in food allowance. About March 31 it was noted that there was a slight weakness in coordination in the hind legs which was chiefly noticeable in walking, especially on a wet slippery floor. This has persisted and is now seemingly more marked. The nature of this neurological condition, which seems identical with that of dog 119 of experiment 19, is not understood. Is lively and playful. Does not present and has not presented at any time during the period of 11 months any recognizable evidence of blacktongue.

Dog 118.—Bitch. Acquired April 9, 1927. On stock diet to May 12, 1927.

May 12, 1927: In good condition; weighs 7.8 kilograms.

April 10, 1928: Weighs 9.8 kilograms. Is in good condition. Has presented no recognizable evidence of blacktongue during the experimental period of 11 months.

Results and conclusions.—It appears from the foregoing that none of the five test dogs presented any recognizable signs of blacktongue during the experimental period of 11 months. Recalling that dogs fed basic diet No. 123 (Table 1) may be expected to develop black-

tongue within a period only exceptionally longer than about 60 days (2), and recalling further that test diet No. 292 differs from diet No. 123 essentially only in that dried pig's liver replaces nearly all of the casein of the latter diet, it clearly follows that the difference in the results of the feeding must be attributed to the liver. We may conclude, therefore, that dried and cooked pork liver contains the blacktongue preventive; and since the minimum preventive quantity would seem to be not more, and may be, or probably is, less, than that indicated by the quantity contained in diet No. 292, the liver may be considered as, at least, a good, if not rich, source of the blacktongue preventive. Liver has not, as yet, been studied by us in pellagra.

SALMON

In much of the rural area and in many of the isolated industrial communities of the southern part of the United States where pellagra is most prevalent, the fresh meat supply is very restricted or there is none at all from about the first of March until some time in October or November. During this period fresh meat is in some measure replaced by preserved meat of some kind, including fish. Among the preserved fish, canned salmon is perhaps the most conspicuous. We therefore thought it worth while to test the blacktongue preventive action of canned salmon, as is shown in the following:

EXPERIMENT 18

In this study of the blacktongue-preventive action of canned salmon we used a canned Alaska chum salmon. The chum salmon is one of the cheaper varieties and was chosen for study for that reason. The entire contents of the can (of 1 pound (454 grams) size), thus including skin and bone, were incorporated in a diet, No. 294, the composition of which is shown in Table 15. As may be seen by reference to Tables 1 and 13 this diet is very similar to basic diet No. 123 and to beef-containing diet No. 196. The amount of salmon included (300 grams per 2,400 calorie ration) was largely arbitrary, although in part influenced by the quantity of lean beef included in diet No. 196. Suitable portions of this diet were offered daily to each of five test animals, dogs 60, 64, 73, 89, and 120. The significant details relating to each are briefly as follows:

Dog 60.—Male. Whelped in the laboratory November 4, 1923. Has suffered several attacks of blacktongue, the latest of which, very evanescent and doubtful, was in evidence June 7, 1926 On stock diet from March 15 to May 27, 1927.

May 27, 1927: In good condition; weighs 8.2 kilograms; begins salmon test diet No. 294.

April 17, 1928: In good condition; weighs 8.6 kilograms; has at no time during the experimental period of ten and a half months presented any recognizable evidence of blacktongue.

Dog 64.—Bitch. Whelped in the laboratory November 4, 1923; has suffered several attacks of blacktongue, the latest of which, evanescent and uncertain, was in evidence September 29, 1926; on stock diet from March 15 to May 27, 1927.

May 27, 1927: In good condition; weighs 7.6 kilograms; begins test diet No. 294.

April 17, 1928: In good condition; weighs 7.8 kilograms; has at no time during the experimental period of ten and a half months presented any recognizable evidence of blacktongue.

Dog 73.—Bitch. Acquired March 19, 1924; has suffered several more or less marked attacks of blacktongue, the latest of which began December 17, 1925; on stock diet from March 15 to May 27, 1927.

May 27, 1927: In good condition; weighs 10.5 kilograms; begins test diet No. 294.

April 17, 1928: In good condition; weighs 11 kilograms; has at no time during the experimental period of ten and a half months presented any recognizable evidence of blacktongue.

Dog 89.—Bitch. Whelped in the laboratory October 12, 1921; has served in two experiments without developing blacktongue; on stock diet from April 6 to May 27, 1927.

May 27, 1927: In good condition; weighs 4.1 kilograms.

April 17, 1928: In good condition; weighs 4.8 kilograms; has presented no recognizable evidence of blacktongue at any time during the experimental period of ten and a half months.

Dog 120.—Bitch. Acquired April 9, 1927; on stock diet to May 27.

May 27, 1927: In good condition; weighs 7.1 kilograms; begins test diet No. 294.

April 17, 1928: In good condition; weighs 9.5 kilograms; has presented no recognizable evidence of blacktongue at any time during the experimental period of ten and a half months.

Results and conclusions.—As is evident from the foregoing, none of the five test animals presented any recognizable evidence of blacktongue during the experimental period of 10½ months. Clearly the test diet exercised complete preventive action. It may therefore be concluded that canned chum salmon contains the blacktongue preventive. The quantity of salmon in the test diet would appear to be a liberal one. How much less might have been equally effective can not be stated.

A comparable study of salmon in pellagra is under way, but is not sufficiently advanced to justify the expression of any judgment as to the outcome.

EGG YOLK

The importance of the hen's egg in the human diet, especially in the diet of children and invalids, and the possibility of its availability under climatic and other conditions which would restrict or make impracticable the supply of fresh meat, suggested the desirability of a test of its blacktongue-preventive action. As the yolk is the portion generally considered to contain the vitamins of the egg, we decided to work with the yolk, and for reasons of practical convenience decided to work with the dried yolk.

We began the study with a commercial preparation of dried, powdered egg yolk, of which we incorporated 100 grams in a 2,400-

caloric ration. As two of the five dogs to which such diet was fed developed blacktongue at the end of 42 and 52 days, respectively, and since we knew nothing of the history of this dried yolk, it was deemed desirable to replace the commercial product with one freshly prepared by ourselves. Accordingly the experiment with the commercial dried yolk was discontinued and the dogs were put on stock diet for reconditioning. Following this the study was resumed and the following experiment was carried out:

EXPERIMENT 19

This was a test of the blacktongue-preventive action of dried egg yolk. Market eggs of excellent quality were boiled hard. The yolks were then separated from the white and run through the meat chopper, after which they were spread out in pans and dried under the fan at room temperature for about 18 hours. The drying was then continued and completed in a current of warm air during an additional period of about 24 hours. So dried, and coarsely ground, the yolks were stored ready for use. Fresh batches were prepared about every two weeks.

The dried egg yolk was incorporated in the diet, No. 293B, shown in Table 16. Except for the character of the dried yolk this diet, it may be remarked, is identical with that in which the commercial powdered egg yolk was tested. It contains, as Table 16 shows, 100 grams of our dried yolk, corresponding to the yolks of about 12 average eggs, in each 2,400 calorie ration. Suitable portions of this diet were daily offered to each of five animals, dogs 41, 63, 67, 70, and 119. The significant details relating to each are as follows:

Dog 41.—Bitch. Whelped in the laboratory June 26, 1923. Up to April 6, 1927, had suffered three attacks of blacktongue, of which the latest began March 4, 1925. On stock diet from April 6 to May 12, 1927. On a commercial dried egg yolk diet from May 12 to June 30, 1927. On stock diet from June 30 to August 2, 1927.

August 2, 1927: In good condition; weighs 11.7 kilograms; begins dried egg yolk test diet No. 293B.

On October 31, or at end of a period of 90 days, presented a suggestive reddening of the mucosa of the floor of the mouth, which was more pronounced next day and then gradually faded so that it was no longer recognizable on November 5, 1927.

April 10, 1928: Has presented no recognizable evidence of blacktongue since the transient indications present between October 31 and November 5, 1927. Weighs 10.7 kilograms. Appears in good condition.

Dog 63.—Male. Whelped in the laboratory November 4, 1923. Has served in several experiments and has suffered several attacks of blacktongue, the latest of which began June 28, 1927, while on a commercial dried egg yolk diet. On stock diet from June 30 to August 2, 1927.

August 2, 1927: In good condition; weighs 9 kilograms; begins test diet No. 293B.

On October 28, or at the end of a period of 87 days, presented the first signs of an attack of blacktongue, a sharply limited bilaterally symmetrical erythema in

bandlike form on mucosa of the upper lip, a reddening of the mucosa of the floor of the mouth and of the cheeks and faucial pillars. Attack became progressively more pronounced necessitating the withdrawal of this animal from the experiment on November 1. Further history not relevant.

Dog 67.—Male. Whelped in the laboratory November 25, 1923. Presented suggestive but evanescent evidence of blacktongue January 13, 1927. Suffered a definite attack of blacktongue, which began June 23, 1927, while on a commercial dried egg yolk diet. On stock diet from June 30 to August 2, 1927.

August 2, 1927: In good condition; weighs 9.9 kilograms; begins test diet No. 293B.

On November 29 presented a suggestive reddening of the floor of the mouth which was no longer perceptible two days later.

On February 9, 1928, presented some very suggestive erythematous patches on the mucosa of the upper lip, which were no longer perceptible on February 11.

On March 6 presented evanescent but very suggestive erythematous patches on the mucosa of the upper lip and a reddening of the mucosa of the floor of the mouth.

On March 20, at the end of a period of 231 days, presented definite beginning signs of an attack of blacktongue, bilaterally symmetrical erythematous bands on the mucosa of the upper lip, reddening of the mucosa of the floor, cheeks, and faucial pillars. This slowly progressed and became so grave by April 5 that treatment was begun, but the attack ended in death April 7–8, 1928.

Dog 70.—Male. Whelped in the laboratory November 25, 1923. Has presented several attacks of blacktongue, the latest indications of which were in evidence August 10, 1926. On a commercial dried egg yolk diet from May 12 to June 30, 1927. On stock diet from June 30 to August 2, 1927.

August 2, 1927: In good condition; weighs 10.3 kilograms; begins egg yolk diet No. 293B.

April 10, 1928: Weighs 9 6 kilograms; in good condition. Has presented no recognizable evidence of blacktongue at any time during the experimental period of eight months

Dog 119.—Bitch. Acquired April 9, 1927. On a commercial dried egg yolk diet from May 12 to June 30, 1927. On stock diet June 30 to August 2, 1927.

August 2, 1927: In good condition; weighs 8.2 kilograms; begins diet No. 293B.

April 10, 1928: About March 22 there was noted as present a weakness or incoordination in the movements of the hind limbs and a slightly high-stepping action of the forelegs, which have persisted. The nature of this neurological manifestation is not clear. Weighs 8 9 kilograms. Seems lively and playful. Has presented no recognizable indications of blacktongue.

Results and conclusions.—As appears in the foregoing, two of the test animals (dogs 63 and 67) developed definite attacks at the end of 87 and 231 days, respectively, while a third presented very suggestive but transient indications of blacktongue. The remaining two of the five test animals presented no recognizable evidence of the disease during the experimental period of fully eight months.

This result indicates quite clearly that the dried egg yolk in the test diet had not exercised adequate blacktongue preventive action. A delaying or partially protective action seems, however, to be definitely suggested, thus indicating that egg yolk contains the blacktongue preventive but, at least when dried and cooked, in relatively

small amount. Although there appears to be no good reason to believe that the drying and cooking to which the yolk was subjected would be likely appreciably to affect the blacktongue preventive contained therein, nevertheless, until this possibility can be definitely excluded, no final conclusion as to the relative richness of the yolk in the blacktongue preventive is warranted by the results of the foregoing experiment. It seems permissible, nevertheless, to suggest in a tentative way that, if, as seems on the whole probable, the potency of the egg yolk is not materially diminished by drying, the cooked yolk, as such, is, gram for gram, inferior in blacktongue preventive potency to fresh beef, pork liver, and wheat germ.

Egg yolk has not yet been tested by us as to its preventive value in human pellagra.

TOMATOES

It may be recalled that the diet used by Goldberger and Wheeler in the first experiment which resulted in the production of blacktongue (2) included tomato juice as one of the components. Tomato juice was, therefore, subsequently included in several experimental diets under the impression that it was without appreciable blacktongue-preventive action. In connection with one such diet, however, in which an amount of juice larger than ordinary was included in order to insure an abundance of "vitamin B," the attacks of blacktongue were so much delayed in their appearance as to suggest that, as in the case of yeast (3), we may not have taken sufficient account of the possibilities of the factor of quantity. This suggested the desirability of a more specific inquiry into the blacktongue-preventive potency of the tomato. Together with certain other considerations it also suggested the desirability of a similar inquiry into its pellagra-preventive potency. A test of the latter was, accordingly, carried out at the Georgia State Sanitarium by Goldberger and Wheeler (13), who, as a result, found that when the daily quantity is sufficiently liberal, the pellagra-preventive action of tomatoes becomes unmistakable. As will be seen, the results of our studies in the dog, presented in the following experiments, lead to the same conclusion with respect to their blacktongue-preventive action.

EXPERIMENT 20

This was a test of the curative and the preventive action of tomatoes, or, more precisely, of the juice pressed from canned tomatoes. The tomatoes were a commercial product of good quality in cans containing about 1 kilogram. The contents of the required number of cans were thrown on a cloth and, in this, hand pressed, and the juice was collected for use. This was done daily. A measured amount—at first about 12 c. c., later increased to 20 c. c., and finally to about 30 c. c. per kilogram of body weight—was daily

administered by drench, using a convenient metal syringe, as a supplement to basic blacktongue producing diet No. 123. (Table 1.) The test animals were five dogs, numbered 13, 50, 66, 81, and 82. Four of these (dogs 50, 66, 81, and 82) were each in the early stage of an attack of blacktongue when the test was begun. The significant details relating to each of the animals are as follows:

Dog 13.—Male. Acquired April 7, 1923. Up to January 18, 1925, served in several experiments and suffered six attacks of blacktongue, of which the latest began January 6, 1925. On stock diet from January 18 to February 18, 1925.

February 18, 1925: In good condition. Weighs 11.2 kilograms. Begins basic blacktongue-producing diet No. 123 with a daily supplement of 132 c. c., or about 12 c. c. per kilogram of body weight, of tomato juice by drench.

September 12: Weighs 10.3 kilograms. Appetite has been dull and food consumption has been on a reduced level. On July 31, presented evanescent signs suggestive of blacktongue. The daily dose of tomato juice is this day increased to 210 c. c., or about 20 c. c. per kilogram of body weight.

March 13, 1926: Weighs 9.7 kilograms. Has presented no definite signs of blacktongue since the suggestive evanescent indications that were present on July 31, 1925. Since some of the other test animals have developed blacktongue, however, an increase in the daily dose to 315 c. c., or about 30 c. c. per kilogram of body weight, is made to-day.

November 17, 1926: Weighs 9.3 kilograms. Has presented no recognizable evidence of blacktongue in over a year. Experiment is discontinued.

Dog 50.—Male. Acquired September 25, 1923. Up to June 23, 1925, served in various experiments and suffered several attacks of blacktongue, the latest of which began June 14, 1925.

June 23, 1925. Had been on basic diet No. 123 for some time and now has an attack of blacktongue, which began June 14. Weighs 12.1 kilograms. Begins treatment with a daily dose of 144 c. c., or 12 c. c. per kilogram of body weight, of tomato juice as a supplement to diet No. 123, which continues to be offered.

September 12: Mouth lesions cleared up promptly. Presented a scrotal lesion of uncertain significance early in July. Weighs 12 kilograms. The daily dose of tomato juice is this day increased to 240 c. c., or 20 c. c. per kilogram of body weight.

March 13, 1926: Presented transient signs suggestive of blacktongue September 17 and November 11, 1925, and January 9, February 16, and March 7, 1926. It is deemed desirable, therefore, to increase the dose of tomato juice to 345 c. c., or about 30 c. c. per kilogram of body weight, effective to-day. Weighs 11.2 kilograms.

March 15, 1927: Weighs 12 kilograms. Presented evanescent signs of blacktongue on March 16, 1926, but has presented none since that date. In good condition. Experiment is discontinued.

Dog 66.—Male. Whelped in the laboratory November 25, 1923. Reared on stock diets. Between April 22, 1924, and June 19, 1925, served in two experiments and suffered an attack of blacktongue, a relapse of which began June 11, 1925.

June 19, 1925: The signs of blacktongue first noted June 11 have become well marked. Began treatment with a daily dose of 132 c. c., or about 12 c. c. per kilogram of body weight, of tomato juice yesterday and begins basic diet No. 123 to-day. Weighs 10.5 kilograms.

September 12: The buccal lesions of blacktongue present when treatment began gradually improved and by the end of June the mouth was about normal. Transient signs of blacktongue were again in evidence, however, on August 22

and August 25. Buccal lesions reappeared September 9; have persisted and are more pronounced to-day. It is decided, therefore, to increase the dose of tomato juice to 230 c. c., or to about 20 c. c. per kilogram of body weight, effective to-day. Diet No. 123 has continued to be offered. Weight four days ago was 11.5 kilograms.

December 17: The signs of blacktongue have several times faded only to reappear —that is, the attack has taken on a chronic relapsing form characterized by marked weakness in the hind legs. The general condition of the animal has been on a decline. Weighs 8.2 kilograms. The tomato-juice treatment is this day supplemented with autoclaved yeast, the administration of which is begun in a dose of 23 grams in gelatine capsules.

January 20, 1926: Weighs 9.6 kilograms. Condition has greatly improved. Signs of blacktongue have cleared up. The autoclaved yeast, which has been given daily, is discontinued. The daily dose of tomato juice is this day increased to 345 c. c., or to about 30 c. c. per kilogram of normal body weight.

December 3, 1926: Presented an evanescent but suggestive injection of the floor of the mouth February 12 and again on May 12. This morning presents very suggestive buccal lesions. During May and June presented a very suggestive desquamative lesion of the scrotum. Three days ago weighed 9.8 kilograms.

January 8, 1927: Buccal lesions noted a month ago gradually faded out. Suggestive reddened lesions on mucosa of upper lip and an injection of the floor are present this morning. A weakness in hind legs similar to that from which he had practically recovered on the yeast treatment has been developing for about a week. The animal walks with difficulty. In walking, the hind legs are spread out so much that the pelvis barely clears the floor. Four days ago weighed 7.9 kilograms. General nutrition poor; eating poorly.

January 18: Condition becoming more unfavorable. Buccal mucosa is pale. Flaccid paraplegia is, if anything, more pronounced. Emaciated. As a whole this animal would seem to be suffering from a chronic blacktongue complicated by self-imposed semistarvation. Gassed. Tissues taken by Dr. James Denton for histopathological study. The chronicity of the disease extending over a period of a year suggests a partially protective action of the tomato juice.

Dog 81.—Male. Acquired October 13, 1924. On stock diet to November 21, 1924.

December 27, 1924: Has been on basic diet No. 123 since November 21 and this morning presents the first signs of an attack of blacktongue, an injection of the mucosa of the floor of the mouth and of the cheeks. Weighs 10.4 kilograms. Begins treatment with tomato juice in a daily dose of 126 c. c., or about 12 c. c. per kilogram of body weight, as a supplement to diet No. 123.

January 2, 1925: Signs of blacktongue have faded. Buccal mucosa is about normal.

April 10: An evanescent reddening of the floor of the mouth was observed on January 23. Not again observed until three days ago, since when it has become more pronounced and definite. The daily dose of tomato juice is, therefore, increased, this day to 189 c. c., or about 18 c. c. per kilogram of body weight. Weighs 11.1 kilograms.

April 13: Mouth appears normal this morning.

November 7: Early in August there appeared a desquamative dermatitis of the scrotum which, ill defined at first, gradually developed more distinctive characters. It has persisted, undergoing repeated changes in intensity. Since August 22, suggestive but transient buccal lesions have number of times appeared and each time faded. They have latterly tended to become more pronounced and definite. Food consumption has been much reduced recently.

Four days ago weighed 9.7 kilograms. Died suddenly this forenoon as the result of a gastric hemorrhage.

The mild relapsing course over a period of some 10 months suggests a delaying of partially protective action of the tomato juice.

Dog 82.—Bitch. Acquired October 13, 1924. On stock diet to November 21, 1924.

December 23, 1924: Has been on basic diet No. 123 since November 21, 1924, and this morning presents the first signs of an attack of blacktongue, reddened lesions on the mucosa of the upper lip, reddening of the mucosa of the floor of the mouth and of the cheeks. Weighs 11.5 kilograms. Begins treatment with tomato juice in a daily dose of 140 c. c., or about 12 c. c. per kilogram of body weight, as a supplement to diet No. 123.

December 27: The attack of blacktongue has become more pronounced. The temperature this morning is 40°. More potent therapy being indicated, the dog is given 23 grams of brewery yeast in capsules in place of the tomato juice.

January 3, 1925: Condition has improved markedly. Mouth is nearly normal. Has received a daily dose of 23 grams of yeast. This is discontinued and the treatment with a daily dose of 140 c. c. of tomato juice is resumed.

March 8: Presents this morning reddened patches on the mucosa of the upper lip and some injection of the floor of the mouth. Weighs 12.7 kilograms.

March 12: Buccal lesions have faded.

April 7. Floor of mouth is suggestively reddened.

April 8: Mouth appears normal.

April 16: Mucosa of cheeks and of floor of mouth suggestively reddened.

April 19: Mouth again normal.

April 28: Mucosa of cheeks and of floor of mouth suggestively reddened.

April 29: Buccal lesions have faded.

September 12: The daily dose of tomato juice is made 280 c. c., or about 20 c. c. per kilogram of body weight. Weighs 14 kilograms

March 13, 1926: Has presented no evidence of blacktongue in nearly a year. The dose of tomato juice is nevertheless increased to 420 c. c., or to about 30 c.c. per kilogram of body weight. Weighs 13 kilograms.

November 17: Since last April has a number of times passed tarry-looking bowel evacuations. Has been eating well. Weighs 14.5 kilograms. Has presented no recognizable evidence of blacktongue since April 29, 1925—that is, during about 18½ months. Experiment is discontinued.

Results and conclusions.—From the foregoing it appears that the dose of tomato juice (about 12 c. c. per kilogram of body weight) tried at the outset was inadequate both in treatment and prevention. But later, following the use of larger doses (20 to 30 c. c. per kilogram) a very definite preventive effect became appreciable (dogs 13, 50, 82), but this was not fully adequate for two of the animals (dogs 66, 81). It may be concluded, therefore, that tomatoes possess blacktongue-preventive action, but that this is of a feeble order, upward of 30 c. c. per kilogram of body weight (of the canned tomato juice) may be needed for complete protection when used as a supplement to such diet as our No. 123 (Table 1). This result is thus in close agreement with the experience of Goldberger and Wheeler, cited in the foregoing, in the human disease. The canned tomato, therefore, contains the preventive for both blacktongue and pellagra, but, considering quantity, contains it in relatively small amount.

CARROTS

As a result of their study of the Chittenden-Underhill syndrome in dogs, Underhill and Mendel (6) reported in May, 1925, that they had found carrots particularly effective in alleviating that syndrome when it was once initiated. Since it had already been suggested (12) that the Chittenden-Underhill syndrome in dogs was probably identical with blacktongue, it seemed desirable to test the efficacy of carrots in the experimental condition with which we were working and which we identified as blacktongue. The following experiment was accordingly carried out.

It may be noted that concurrently with this study in dogs, Goldberger and Wheeler (13) carried out a study of carrots in the human disease and found that the ingestion of the cooked equivalent of some 400 to 450 grams of this vegetable daily was inadequate to prevent pellagra in insane pellagrins weighing 46 to 63 kilograms; the attacks appeared after somewhat longer periods than their experience had led them to expect, thus suggesting a delaying or slightly protective effect of which, however, they could not be sure.

EXPERIMENT 21

This was a test of the curative and the preventive action of carrots in experimental blacktongue. The test animals were five dogs, Nos. 44, 60, 63, 64, and 70. The experiment was begun as a therapeutic study, each one of the animals presenting more or less marked buccal signs of an early stage of the experimental disease. This phase of the experiment lasted about two months and was followed by a period of about one month of reconditioning on stock diet. The preventive test started immediately after this reconditioning period.

The carrots were dressed as for human consumption, run through a meat-chopping machine, and then, with the smallest practicable amount of water, cooked for about two hours in a double boiler. Thus prepared and tender they were offered daily to each animal in definite weighed amounts apart from the basic blacktongue-producing diet. In the later stage of the study a small amount of the basic diet was mixed with the carrots ration of each animal. As a rule, the carrots were offered to the dogs before noon of each day. What was found uneaten a few hours later was forcibly fed. A small, negligible amount was unavoidably wasted in connection with this forced feeding.

The therapeutic dose with which the study was begun represented 180 grams of the raw dressed vegetable per dog per day. As the animals were not of uniform weight, the dose in relation to weight varied from about 15 to 25 grams per kilogram. This was increased

to 270 grams, or from about 25 to 40 grams per kilogram of body weight, during about the last two weeks of this phase of the study.

The preventive dose begun with was the equivalent of 300 grams of raw dressed carrots per dog per day, or from about 25 to 40 grams per kilogram of body weight. After a period of three months this was increased to 600 grams per dog per day, or to about 50 to 85 grams per kilogram of body weight.

The basic diet used during the first period was our blacktongue producing diet No. 209 on which, indeed, four of the test animals (dogs 44, 60, 63, and 64) had developed the attacks for which they were given the carrots by way of treatment. The fifth dog had developed the attack on another diet, but was given diet No. 209 when treatment with carrots was begun Diet No. 209 is our diet No. 123 (Table 1), the white corn meal of which was quantitatively replaced by yellow meal (3). During the preventive period of the test, basic diet No. 123 was used. The significant details are briefly as follows:

Dog 44.—Male. Whelped in the laboratory June 26, 1923. Served in several experiments and suffered three attacks of blacktongue, of which the latest began September 1, 1925, while on test diet No. 209.

September 15: The attack of blacktongue, the first signs of which appeared September 1, is now well defined but still mild. Weighs 12.1 kilograms. Continues on diet No. 209 and begins treatment with cooked carrots, the equivalent of 180 grams of the raw dressed vegetable, or about 15 grams per kilogram of body weight per day.

November 4: Weighs 11 3 kilograms. The mouth lesions present September 15 slowly faded, but almost at once began to reappear and have gradually become well defined and characteristic. The daily allowance of carrots is therefore increased effective to-day to the equivalent of 270 grams, or about 25 grams per kilogram of body weight, of the raw vegetable.

November 19: No beneficial effect being appreciable, the administration of carrots and basic diet No. 209 are discontinued and stock diet for reconditioning is begun. Weighs 11.4 kilograms.

December 17: All evidence of blacktongue rapidly cleared up following inauguration of the stock diet. Weighs 11.9 kilograms. In good condition. Begins basic diet No. 123 with a supplement of cooked carrots, representing 300 grams, or about 25 grams per kilogram of body weight, of the raw vegetable.

March 16, 1926: Slight but very suggestive indications of blacktongue appeared February 4. They soon faded, but have several times since then alternately reappeared and faded. Although not in evidence to-day, it is deemed desirable nevertheless to increase the daily supplement of carrots to the equivalent of 600 grams, or about 50 grams per kilogram of body weight, of the raw dressed vegetable. Weighs 12.6 kilograms.

March 15, 1927: On May 13, 1926, presented a slight but suggestive erythema of the scrotum which gradually faded and was entirely gone three days later. Has presented no buccal evidence of blacktongue in fully a year. Weighs 11.4 kilograms. Experiment is discontinued.

Dog. 60.—Male. Whelped in the laboratory November 4, 1923. Served in several experiments and has suffered two attacks of blacktongue, the latest of which began September 13, 1925, while on test diet No. 209.

September 15, 1925: The buccal lesions of the attack, the first signs of which appeared two days ago, are mild but definite this morning. Weighs 7.4 kilograms. Begins treatment with boiled carrots, of which the equivalent of 180 grams, or about 25 grams per kilogram of body weight, of the raw dressed vegetable is to be administered daily.

November 6: The mouth lesions present when feeding of carrots began faded and were no longer recognizable five days later. A suggestive evanescent injection of the floor of the mouth was present October 3. Weighs 7.4 kilograms. The daily dose of carrots is this day increased to the equivalent of 270 grams, or about 35 grams per kilogram of body weight, of the raw dressed vegetable.

November 19: Suggestive buccal signs of blacktongue appeared two days ago. They are still faintly perceptible this morning. Begins stock diet for reconditioning.

December 17: Two days after the change to the stock diet all mouth signs were gone. General condition has improved. Weighs 8.1 kilograms. Resumes the test of carrots by beginning basic diet No. 123 with a daily supplement of cooked carrots equivalent to 300 grams, or about 35 grams per kilogram of body weight, of the raw dressed vegetable.

March 16, 1926: During the past two or three weeks has repeatedly presented slight, evanescent and more or less strongly suggestive buccal signs of blacktongue. Still presents some injection of the floor of the mouth which appeared three days ago. Weighs 7 5 kilograms.

The daily allowance of boiled carrots is this day increased to the equivalent of 600 grams, or about 70–80 grams per kilogram of body weight, of the raw dressed vegetable.

April 28: The mouth lesions present on March 16 faded in the course of the succeeding two or three days, but have alternately reappeared and faded two or three times since. Mouth is normal this morning. Weighs 7 kilograms.

May 26: A marginated scrotal dermal lesion began to develop about May 1. It gradually increased in extent and became desquamative. It has alternately paled and brightened a number of times, and then gradually cleared up so that the scrotum is well-nigh normal this morning. Buccal lesions of blacktongue reappeared May 13 and gradually became quite pronounced, but have practically completely faded. Weighs 7 kilograms.

June 7: Floor of mouth presents a suspicious injection.

June 9, 1926: Mouth is about normal.

May 15, 1927: Has presented no evidence of blacktongue since early last June, that is, during a period of about nine months. Weighs 7.5 kilograms. Experiment is discontinued.

Dog 63.—Male. Whelped in the laboratory November 4, 1923. Has served in several experiments and has suffered three attacks of blacktongue, the latest of which began August 29, 1925, while on test diet No. 209.

September 15, 1925: The attack of blacktongue, the first signs of which appeared August 29, has become definitely marked, but is still mild. Weighs 6.8 kilograms. Diet No. 209 is continued. Begins treatment with boiled carrots in a daily dose representing 180 grams, or about 25 grams per kilogram of body weight, of the raw dressed vegetable.

November 6: The buccal signs of blacktongue have alternately faded and reappeared a number of times since the treatment with carrots was begun. Weighs 7.2 kilograms. The dose of boiled carrots is this day increased to an equivalent of 270 grams, or about 35 grams per kilogram of body weight, of the raw vegetable.

November 19: In spite of the increased dose of carrots the buccal lesions of blacktongue have become more severe. Temperature was 40° yesterday and

is 39.9° this morning. Diet No. 209 and carrots are discontinued and stock diet is begun. Two days ago weighed 6.5 kilograms. Eating poorly.

November 21: The condition of the animal seeming to be grave, it was given a dose of 7 grams of a dried yeast extract yesterday and another today. Refused all food yesterday.

December 7: Condition has rapidly improved. Appetite returned a day or two after the second dose of the yeast extract and has been eating well since.

December 17: In good condition. Weighs 7.1 kilograms. Begins diet No. 123 with a daily supplement of the coooked equivalent of 300 grams, or about 40 grams per kilogram of body weight, of raw dressed carrots.

January 23, 1926: Presents this morning strongly suggestive buccal sings of blacktongue.

March 16: The mouth lesions noted January 23 became more pronounced, then faded only to reappear and are appreciable this morning. It is deemed desirable, therefore, to increase the allowance of carrots. Effective to-day the cooked equivalent of 600 grams, or about 80 grams per kilogram of body weight, of raw dressed carrots is offered and is to be offered daily.

June 27: The mild buccal lesions present on March 16, when the allowance of carrots was increased, gradually faded but soon reappeared only to fade again. This alternate appearance and disappearance has been two or three times noted; the latest appearance of a slight injection of the floor of the mouth was yesterday but is not appreciable this morning. A very strongly suggestive dermal scrotal lesion made its appearance on May 12 but had cleared up by May 25. Weighs 6.6 kilograms.

May 15, 1927: During the past 8½ months there has been no evidence suggestive of blacktongue. Weighs 7.6 kilograms. Experiment is discontinued.

Dog 64.—Bitch. Whelped in the laboratory November 4, 1923. Has suffered two attacks of blacktongue, the latest of which began September 12, 1925, while on test diet No. 209.

September 15, 1925: Slight buccal signs of the attack which began three days ago are in evidence. Weighs 6.8 kilograms. Continues diet No. 209 and begins treatment with cooked carrots in a daily dose equivalent to 180 grams, or about 25 grams per kilogram of body weight, of the raw vegetable.

November 6: The mouth lesions present when treatment was begun faded and were no longer appreciable five days later. On October 20 a suggestive injection of the floor of the mouth was again in evidence, but faded during the succeeding three days. Weighs 6.6 kilograms. The daily allowance of boiled carrots is this day increased to the equivalent of 270 grams, or about 40 grams per kilogram of body weight, of the raw dressed vegetable.

November 19: Strongly suggestive mouth lesions reappeared two days ago and continue in evidence this morning. Diet No. 209 and treatment with carrots discontinued and stock diet is begun for reconditioning.

December 17: Mouth has been normal in appearance since November 21. In good condition. Weighs 7.2 kilograms. Begins diet No. 123 with a daily supplement of boiled carrots equivalent to 300 grams, or about 40 grams per kilogram of body weight, of the raw dressed vegetable.

March 16, 1926: Presented a suggestive injection of the floor of the mouth on February 20, which had largely faded by February 23. It was again in evidence for two or three days beginning March 2 and reappeared three days ago, but has completely faded. Weighs 6.2 kilograms. The daily allowance of boiled carrots is to-day increased to the equivalent of 600 grams, or about 85 grams per kilogram of body weight, of the raw vegetable.

October 1: Presented a suggestive injection of the mucosa of the floor of the mouth on March 21, which faded in three or four days. Has been free of any

suggestion of blacktongue until two days ago (about six months) when a suggestive reddening of the floor of the mouth was in evidence but is no longer appreciable. Weighs 7 kilograms.

March 15, 1927: There has been no suggestion of blacktongue since the evanescent injection of the floor of the mouth in evidence September 29, 1926—five and a half months ago. Weighs 7.3 kilograms. In good condition. Experiment discontinued.

Dog 70.—Male. Whelped in the laboratory November 25, 1923. Has served in several experiments and has suffered two attacks of blacktongue, the latest of which began September 15, 1925, while on wheat germ diet No. 197.

September 18, 1925: Three days ago weighed 9.6 kilograms. The attack of blacktongue, the first signs of which appeared three days ago, is now well marked. Begins diet No. 209 with a supplement of boiled carrots equivalent to 280 grams, or about 30 grams per kilogram of body weight, of the raw dressed vegetable.

September 28: The mouth lesions became quite severe, but have shown a marked improvement during the past three or four days. Has taken none of the basic diet since September 21, but a little of it was mixed with the boiled carrots yesterday and so forcibly fed. Weighs 7.8 kilograms. Beginning to-day the daily dose of boiled carrots will be the equivalent of 180 grams, or about 20 grams per kilogram of body weight, of the raw vegetable.

October 7: The mouth is now about normal in appearance.

November 19: Buccal lesions suggestive of blacktongue reappeared about two weeks ago and have gradually become more definite. Weighs 9.2 kilograms. Diet No. 209 and carrots discontinued and stock diet for reconditioning begins.

December 17: Weighs 9.4 kilograms. Is in good condition. Begins diet No. 123 with a daily supplement of boiled carrots—the equivalent of 300 grams, or about 30 grams per kilogram of body weight, of the raw dressed vegetable.

March 16, 1926: Has presented evanescent, but suggestive, buccal signs of blacktongue which were in evidence on February 4 and again three days ago and which are more definite to-day. Weighs 10.2 kilograms. The allowance of boiled carrots is this day increased to the equivalent of 600 grams, or about 60 grams per kilogram of body weight, of the raw vegetable.

March 18: Mouth is about normal again.

June 10: Slight but suggestive buccal lesions appeared a week ago but are no longer appreciable.

June 19: Some suggestive injection of the floor of the mouth reappeared a week ago but is no longer recognizable.

July 7: A suggestive injection of the floor of the mouth appeared July 1, but has faded.

July 17: The distinctive erythematous bandlike lesion on the mucosa of the upper lip has appeared this morning. Has a suggestive scrotal lesion, which made its appearance two days ago.

July 19: Mouth lesions have faded. Scrotal lesion is less marked.

July 21: Scrotum practically normal.

August 16: Suggestive buccal lesions again appeared on August 10 but have completely faded. Four days ago weighed 9.5 kilograms.

March 15, 1927: Has presented no evidence of blacktongue since early last August—that is, during a period of about seven months. Weighs 10.2 kilograms. Experiment is discontinued.

Results and conclusions.—In none of the five test animals during the first or exclusively curative phase of the study could a beneficial effect be recognized.

In the initial stage of the preventive test the ingestion daily of a quantity of boiled carrots representing 300 grams, or about 25 to 40 grams per kilogram of body weight, of the raw dressed vegetable failed to prevent completely the development of evidence of blacktongue in any one of the test animals. The increase in the allowance of boiled carrots to the equivalent of 600 grams, or to about 50 to 85 grams of the raw vegetable per kilogram of body weight, was followed by a slow clearing up of the evidence of blacktongue, with subsequent freedom from all indications of the disease during periods of observation of between 5½ and 10 months. Thus over 40 grams of the vegetable per kilogram of body weight were required as a supplement to our basic diet No. 123 before a blacktongue preventive action became definitely appreciable. This would seem to indicate that carrots contain the blacktongue preventive, but in relatively small amount. The failure in pellagra prevention reported by Goldberger and Wheeler (13), cited in the foregoing, would thus appear to be entirely consistent with this result in the canine disease.

RUTABAGAS

Shortly after beginning the study of carrots, presented in the foregoing, we undertook a study of the blacktongue preventive action of the rutabaga turnip. At about the same time a pellagra-preventive study of this vegetable was begun by Goldberger and Wheeler (13) at the Georgia State Sanitarium. It was at first planned to work with the common white turnip in both investigations, but finding that an adequate supply of this vegetable throughout the year would be less certain than that of the rutabaga, the latter was finally selected for study in both. The results of the study of pellagra prevention, already reported by Goldberger and Wheeler (13), indicate that the cooked dressed rutabaga contains so little of the pellagra preventive that the daily ingestion of the equivalent of 1 pound of the raw dressed vegetable was without recognizable pellagra preventive action. The determination of what the ingestion of a larger quantity might have shown with respect to preventive potency was not attempted.

Our study of the rutabaga in blacktongue is presented in the following:

EXPERIMENT 22

This was a test of the blacktongue preventive action of the rutabaga turnip when fed as a supplement to our basic blacktongue-producing diet No. 123. (Table 1.)

The rutabagas were peeled as for human consumption, run through a meat chopper, and then cooked in a small amount of added water in a double boiler for about two hours. Thus cooked and tender they were offered daily in weighed amounts to each dog apart from

the basic diet. As it soon appeared that the dogs would take the cooked rutabagas better if mixed with some of the other food, this practice was adopted and maintained to the end of the experiment. As in the case of the carrots, the ration of rutabagas was served the dogs shortly before noon of each day. What was found unconsumed a few hours later was forcibly fed. Incidentally, as with the carrots, a small, negligible part of the rutabaga ration was unavoidably wasted.

The preventive dose begun with was the same as that with carrots, namely, the cooked equivalent of 300 grams of the raw dressed vegetable per dog per day. As the test animals differed somewhat in weight, this made a dose that varied for the respective animals between 25 and 35 grams per kilogram of body weight. At the end of about six weeks of this dosage one of the animals manifesting suggestive evidence of blacktongue, and thus of a probable preventive inadequacy, the daily allowance was at once doubled for all of this lot of dogs in order, if possible, to insure a preventive effect. The allowance thus increased was maintained to the close of the experiment, which lasted in all about 13½ months.

Four test animals, dogs 67, 73, 93, and 95 were used. The significant details relating to each of the animals are as follows:

Dog 67.—Male. Whelped in the laboratory November 25, 1923. Reared and maintained on stock diets up to February 2, 1926.

February 2, 1926: In good condition. Weighs 9.6 kilograms. Begins basic diet No. 123 and a daily supplement of boiled rutabagas representing 300 grams, or about 30 grams per kilogram of body weight, of the raw dressed vegetable.

March 16: Presented, two days ago, a slight injection of the floor of the mouth, which was distinctly perceptible yesterday but is entirely gone this morning. This evanescent but suggestive indication of blacktongue and, thus, of a preventive inadequacy of the allowance of the rutabagas, makes an increase desirable in order if possible to insure a preventive effect. Accordingly, the daily supplement of boiled rutabagas is this day increased to the equivalent of 600 grams, or about 60 grams per kilogram of body weight, of the raw dressed vegetable.

January 13, 1927: Presents this morning an ill-defined, faintly reddened patch on the mucosa of the upper lip in the region of the canine teeth of each side. Mucosa of the cheeks is slightly flushed and that of the floor of the mouth is slightly injected. Weighs 7.8 kilograms.

January 14: Mouth is normal this morning.

March 15, 1927: Except for the evanescent but suggestive indication of blacktongue in evidence January 13, 1927, this animal has been free of recognizable indications of blacktongue during a period of one year. Experiment is discontinued.

Dog 73.—Bitch. Acquired March 19, 1924. Up to December 19, 1925, suffered two uncertain, evanescent, and one definite attack of blacktongue, the latest of which began December 17, 1925. On stock diet for reconditioning from December 19, 1925, to February 2, 1926.

February 2, 1926: In good condition. Weighs 9.4 kilograms. Begins basic diet No. 123 and a daily supplement of boiled rutabagas representing 300 grams, or about 30 grams per kilogram of body weight, of the raw dressed vegetable.

March 16, 1926: Has presented no suggestion of blacktongue, but by reason of suggestive indications presented by dog 67, the daily supplement of boiled rutabagas is this day doubled. Weighs 9.9 kilograms.

March 15, 1927: Has presented nothing suggestive of blacktongue during the period of 13½ months since the beginning of the experiment. Weighs 9.5 kilograms. In good condition. Experiment discontinued.

Dog 93.—Male. Acquired November 5, 1925. On stock diet to February 2, 1926.

February 2, 1926: In good condition. Weighs 12.2 kilograms. Begins basic diet No. 123 with a daily supplement of boiled rutabagas representing 300 grams, or about 25 grams per kilogram of body weight, of the raw dressed vegetable.

March 16, 1926: Has presented nothing suggestive of blacktongue, but, as in the case of dog 73, the daily supplement of boiled rutabagas is doubled. Weighs 12.9 kilograms.

March 15, 1927: Has presented nothing suggesting blacktongue during the period of 13½ months since the beginning of the experiment. In good condition. Weighs 13.7 kilograms. Experiment is discontinued.

Dog 95.—Male. Acquired November 30, 1925. On stock diet to February 2, 1926.

February 2, 1926: In good condition. Weighs 8 6 kilograms. Begins basic diet No. 123 with a daily supplement of boiled rutabagas representing 300 grams, or 35 grams per kilogram of body weight, of the raw dressed vegetable.

March 16, 1926: As in the case of dogs 73 and 93, the daily supplement of boiled rutabagas is this day doubled. Weighs 8.6 kilograms.

March 15, 1927: Has presented no indications of blacktongue during the experimental period of 13½ months. Food consumption has been variable; has lost some in weight, which is 7.3 kilograms. Experiment is discontinued.

Results and conclusions.—Of the four test animals, one (dog 67) presented transient but suggestive indications of blacktongue about 40 days after beginning the experiment and while receiving daily the boiled equivalent of about 30 grams of the raw dressed vegetable per kilogram of body weight. The same animal again presented evanescent signs suggesting blacktongue about 10 months after beginning a daily allowance of the boiled equivalent of about 60 grams of the raw dressed vegetable per kilogram of body weight. None of the other three animals (dogs 73, 93, and 95) presented any evidence of blacktongue at any time during the test period of 13½ months. It would appear therefore that the rutabagas contain the blacktongue preventive, but in relatively small amount, since the cooked equivalent of upward of 60 grams of the raw dressed vegetable per kilogram of body weight may be needed for complete protection of the dog.

It may be noted that the failure reported by Goldberger and Wheeler (12) to recognize any pellagra preventive effect following the daily ingestion of the cooked equivalent of one pound of raw dressed rutabagas is entirely consistent with this result in blacktongue.

RELATION OF BLACKTONGUE TO PELLAGRA

In the foregoing we have presented the results of our study of the blacktongue-preventive action of a series of foodstuffs of considerable variety, numbering 16 in all. Since the principal object of that study has been to secure evidence concerning the relation of the blacktongue preventive to the pellagra preventive and, thus, of blacktongue to pellagra, an attempt has been made to correlate the blacktongue-preventive potency of each foodstuff to its pellagra-preventive potency where this was known.

As will have been seen, 11 of the foodstuffs (namely, maize, wheat germ, cowpea, soy bean, milk, butter, cod-liver oil, lean beef, tomato, carrot, and rutabaga) have been studied for their preventive action in both conditions. In the case of eight of these (maize, wheat germ, cowpea, milk, butter, cod-liver oil, lean beef, tomato) our knowledge of their preventive potency or lack of it for the two conditions under consideration is of such character as to permit of a rough but sufficiently satisfactory comparison for the present purpose; in each one of these eight the preventive potency for pellagra is, as has been pointed out, strikingly similar to that for blacktongue.

With respect to 3 of the 11 foodstuffs, namely, the soy bean, carrot, and rutabaga, our knowledge of their pellagra-preventive potency is not sufficient to permit of satisfactory comparison with their blacktongue-preventive action. Such general indications as are afforded, however, justify the expectation that additional investigation of their preventive potency for pellagra will reveal this to be similar to their preventive potency for blacktongue.

In brief, then, it seems clearly indicated that, so far as they have been studied, the foodstuffs that appear to be good sources of the blacktongue preventive also appear to be good sources of the pellagra preventive; those that appear to be poor sources of, or lacking in, the blacktongue preventive likewise appear as poor sources of, or lacking in, the pellagra preventive. This, it should be noted, is not a mere similarity in distribution of the respective preventive essentials among the foodstuffs—it is a similarity in the potency of the action of those foodstuffs in the respective pathological conditions and, thus, this would seem to constitute evidence of weight pointing to the identity of the preventive essentials and, therefore, to the identity of blacktongue and pellagra.

Considering the foregoing evidence in conjunction with the evidence presented in our previous communications (2), (3), namely, the striking clinical resemblance of the disease in the dog to the disease in man, the suggestion of a common etiology indicated by the successful production of the disease in the dog by feeding pellagra-producing diets, the effectiveness of dried yeast and a dried aqueous extract of yeast as preventives of both conditions, together with the

fact of the successful production of a pellagra-like condition in the albino rat by feeding a diet deficient in a food essential which is indistinguishable from the preventive of blacktongue [1] (14), as well as with the evidence revealed by Denton's study (5) showing that there is a marked similarity in the gross and microscopic tissue changes of blacktongue and pellagra—considering all this evidence as a whole, it would seem highly probable, if not certain, that experimental blacktongue and pellagra are essentially identical conditions and, thus, that the preventive of blacktongue is identical with the pellagra preventive or factor P-P.

If this conclusion is, as we believe, sound, it manifestly follows that the results of tests of preventive action carried out in the dog are applicable to the disease in man and, thus, that the indications presented in the foregoing with respect to the blacktongue-preventive potency of certain of the foodstuffs (liver, salmon, egg yolk) not yet studied directly in pellagra may be accepted as having corresponding significance for that disease. We would, accordingly, recommend liver, salmon, and egg yolk for use in the treatment and prevention of pellagra.

SUMMARY AND CONCLUSIONS

The blacktongue-preventive potency of 16 foodstuffs has been studied and correlated to the pellagra preventive potency (or lack of it) of those, eleven in number, for which this was known, with the following results:

Maize, if it contains any, is a poor source of the preventive for both blacktongue and pellagra.

Whole *wheat* contains the blacktongue preventive, but in small amount.

Commercial *wheat germ* contains, and may be rated as a relatively good source of, the preventive for both blacktongue and pellagra.

The *cowpea* contains, but is a poor source of, the preventive for both blacktongue and pellagra

The *soy bean* contains the blacktongue preventive, but in relatively small amount, appreciably more, however, than the cowpea, but considerably less than the extracted wheat germ. So far as it goes the experience with the soy bean in the human disease is, at least, not inconsistent with that in the experimental disease of the dog.

Milk contains the preventive for both the human and the canine disease, but contains it in relatively small amount.

Butter, while not devoid of it, is a relatively very poor source of the blacktongue preventive, a conclusion that is in harmony with the experience with butter in pellagra.

Cod-liver oil would seem very poor in or lacking the preventive for both blacktongue and pellagra.

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[1] Since the experimental pellagra-like condition in the albino rat appears to be due to a deficiency of the same food essential as is experimental blacktongue, that is to say, since these two conditions appear to be etiologically indistinguishable, proof of the identity of blacktongue and pellagra is also, of course, proof of the fundamental identity of the condition in the rat and the disease (pellagra) in man.

Cottonseed oil contains little, if any, of the preventive for blacktongue. No specific study of the effectiveness of this oil in pellagra has been made; on the basis of general experience it seems unlikely that this oil contains the pellagra preventive in significant amounts.

Beef muscle is a good source of the preventive for both blacktongue and pellagra.

Pork liver is a good source of the blacktongue preventive; it has not yet been studied in pellagra.

Canned salmon contains the blacktongue preventive. A study of its effectiveness in pellagra is in progress.

Egg yolk contains the blacktongue preventive; a specific study of its value in pellagra has not yet been undertaken.

The canned *tomato* contains the preventive for both blacktongue and pellagra, but in relatively small amount.

The *carrot* contains, but is a relatively poor source of, the preventive of blacktongue. Its reported failure in pellagra prevention is consistent with the indications of its feebleness as a blacktongue preventive.

The *rutabaga* turnip contains, but is a relatively poor source of, the blacktongue preventive. Its failure in pellagra prevention is consistent with its poverty in the blacktongue preventive.

So far as they have been studied, the foodstuffs that appear to be good sources of the blacktongue preventive also appear to be good sources of the pellagra preventive; those that appear to be poor sources of, or lacking in, the blacktongue preventive likewise appear to be poor sources of, or lacking in, the pellagra preventive.

Considering the available evidence as a whole, it would seem highly probable, if not certain, that experimental blacktongue and pellagra are essentially identical conditions and thus that the preventive of blacktongue is identical with the pellagra preventive, or factor P-P.

On the basis of the indications afforded by the test in the dog, liver, salmon, and egg yolk are recommended for use in the treatment and prevention of pellagra in the human.

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(Tables 1–16 follow)

TABLE 1.—*Composition of basic blacktongue-producing diet No. 123* [1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients: Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal [2]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*) [3]	50	10.7	.7	30.4
Casein (purified) [4]	60	52.0		
Sucrose	32			32.0
Cottonseed oil	30		30.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		96.3	64.5	358.4
Nutrients per 1,000 calories		40.1	26.9	149.3

[1] The corn meal, cowpeas (previously coarsely ground), and salt are stirred into water and cooked in a double boiler of enamel ware for about 1½ hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents 1 calorie), and this finished mixture is served to the dog ad libitum.
[2] Whole maize meal (white) sifted as for human consumption.
[3] The variety known as the California black-eyed pea.
[4] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15).

TABLE 2.—*Composition of maize diets No. 149*[1] *and No. 149A*[1]

[Total calories, 2,354]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Whole white cornmeal	450	[2] 45.5	[2] 22.5	328.0
Casein (purified)[3]	90	78.8		
Salts [4]				
Cod-liver oil	8		8.0	
Butterfat (in diet No. 149) / Cod-liver oil (in diet No. 149A)	30		30.0	
Total nutrients		124.3	60.5	328.0
Nutrients per 1,000 calories		52.9	25.7	139.6

[1] The maize meal is stirred into water and boiled one and one-half hours. The other ingredients are then added and well stirred in, the total weight being brought to 2,354 grams with water (so that 1 gram represents 1 calorie). The finished mixture is served to the dog in suitable calorie portion.
[2] The factors used are those given by Henry and Morrison ("Feeds and Feeding") for dent corn.
[3] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15).
[4] McCollum's well-known salt mixture 185 (Am. Jour. Physiol., 1916, vol. 41, p. 357).

TABLE 3.—*Composition of wheat diet No. 128*[1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Wheat meal (whole kernel)	400	[2] 49.6	[2] 8.4	293.6
Cowpeas (*Vigna sinensis*)	50	10.7	.7	30.4
Casein (purified)[3]	60	52.0		
Sucrose	24			24.0
Cottonseed oil	38		38.0	
Cod-liver oil	15		15.0	
Sodium cholride	10			
Calcium carbonate	3			
Total nutrients		112.3	62.1	348.0
Nutrients per 1,000 calories		46.8	26.0	145.0

[1] The wheat meal, cowpeas (previously coarsely ground), and sodium chloride are stirred into water and cooked about one and one-half hours. Then the other ingredients are well stirred in, the total weight being brought to 2,400 grams with water (so that 1 gram represents 1 calorie). The finished mixture is served to the dogs in suitable portions.
[2] Factors used as given by Henry and Morrison ("Feeds and Feeding") for wheat, "all analyses."
[3] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15).

TABLE 4.—*Composition of wheat-germ diet No. 197*[1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Wheat germ (ether-extracted)	180	52	0.2	112
Casein (purified)[2]	50	44		
Cornstarch	240			216
Sucrose	32			32
Cottonseed oil	49		49.0	
Cod-liver oil	15		15.0	
Salt mixture [3]	22			
Total nutrients		96	64.2	360
Nutrients per 1,000 calories		40	26.7	150

[1] The wheat germ, starch, and cottonseed oil are stirred into water and cooked about 1½ hours. The other ingredients are then well stirred in and the final weight is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). The finished mixture is served to the dogs in suitable calorie portions.
[2] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15).
[3] After Osborne and Mendel (16).

TABLE 5.—*Composition of cowpea diet No. 286*[1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients: Protein	Nutrients: Fat	Nutrients: Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Cowpeas (*Vigna sinensis*)	360	77.0	5.0	218.9
Casein (purified)[2]	60	53.2	.3	
Sucrose	30			30.0
Cornstarch	80			72.0
Cottonseed oil	46		46.0	
Cod-liver oil	15		15.0	
Salt mixture[3]	15			
Total nutrients		130.2	66.3	320.9
Nutrients per 1,000 calories		54.25	27.62	133.7

[1] The cowpeas (previously coarsely ground), sucrose, and starch were stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in and the final weight is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). The mixture is served to the dog in suitable calorie portions.
[2] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15)
[3] After Osborne and Mendel (16).

TABLE 6.—*Composition of cowpea diet No. 299*[1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients: Protein	Nutrients: Fat	Nutrients: Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Cowpeas (*Vigna sinensis*)	450	96.3	6.3	273.6
Casein (purified)[2]	60	53.2	.3	
Cornstarch	30			27.0
Cottonseed oil	45		45.0	
Cod-liver oil	15		15.0	
Salt mixture[3]	15			
Total nutrients		149.5	66.6	300.6
Nutrients per 1,000 calories		62.2	27.7	125.2

[1] The cowpeas (previously coarsely ground) and cornstarch are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in and the final weight is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). The mixture is served to the dog in suitable calorie portions.
[2] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15).
[3] After Osborne and Mendel (16).

TABLE 7.—*Composition of soy-bean diet No. 110*[1]

[Total calories, 2,260]

Articles of diet	Quantity	Nutrients: Protein	Nutrients: Fat	Nutrients: Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Soy beans[2]	85	31.0	14.9	26.2
Cornmeal[3]	200	16.8	9.4	148.0
Wheat farina (Quaker brand)	100	11.4	1.0	75.0
Rice (white)	28	2.2	.0	22.1
Cowpeas (*Vigna sinensis*)	14	3.0	2.0	8.5
Cornstarch	35			31.5
Cottonseed oil	42		42.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Tomato juice (canned tomatoes)	130			
Total nutrients		64.4	84.3	311.3
Nutrients per 1,000 calories		28.5	37.3	137.7

[1] The soy beans (previously coarsely ground) are soaked in water over night, then cooked 30 minutes, after which the maize meal, farina, rice, cowpeas (coarsely ground), cornstarch, and sodium chloride are stirred in and this mixture is cooked about 1½ hours, after which the other ingredients are well stirred in and the final weight is brought to 2,500 grams with water. This finished mixture is served to the dog in suitable calorie portions.
[2] Mammoth yellow variety.
[3] Whole maize meal, sifted as for human consumption.

TABLE 8.—*Composition of soy-bean diet No. 287* [1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients: Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Soy beans [2]	360	13.4	63.0	110.9
Cornstarch	224			202.0
Cod-liver oil	6		6.0	
Salt mixture [3]	15			
Total nutrients		131.4	69.0	312.9
Nutrients per 1,000 calories		54.8	28.8	130.4

[1] The soy beans are coarsely ground and soaked in water over night. The starch is then added and, with the soy beans, cooked about 2 hours. After this the other ingredients are well stirred in and the final weight is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). The finished mixture is served to the dog in suitable calorie portions.
[2] The mammoth yellow variety.
[3] After Osborne and Mendel (16).

TABLE 9.—*Composition of cod-liver-oil diet No. 114* [1] *and of Milledgeville butterfat diet No. 115* [1]

[Total calories, 2,410]

Articles of diet	Quantity	Nutrients: Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Cornmeal [2]	200	16.8	9.4	148.0
Wheat farina (Quaker brand)	100	11.4	1.0	75.0
Rice, white	28	2.2		22.1
Cowpeas (*Vigna sinensis*)	14	3.0	2.0	8.5
Cod-liver oil [3] (for diet No. 114) / Butterfat [3] (for diet No. 115)	128		128.0	
Sodium chloride	10			
Calcium carbonate	3			
Tomato juice (canned tomatoes)	130			
Total nutrients		33.4	140.4	253.6
Nutrients per 1,000 calories		13.8	58.3	105.2

[1] The maize meal, wheat farina, rice, cowpeas (previously coarsely ground), and sodium chloride are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in and the total weight is brought to 2,000 grams with water. The finished mixture is served to the dog in suitable calorie portions.
[2] Whole white maize meal, sifted as for human consumption.
[3] For origin see text.

TABLE 10.—*Composition of Beltsville butter diet No. 115B* [1]

[Total calories, 2,415]

Articles of diet	Quantity	Nutrients: Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal [2]	200	16.8	9.4	148.0
Wheat farina (Quaker brand)	100	11.4	1.0	75.0
Rice, white	28	2.2		22.1
Cowpeas (*Vigna sinensis*)	14	3.0	2.0	8.5
Beltsville butter [3]	160	1.6	128.0	
Sodium chloride	10			
Calcium carbonate	3			
Tomato juice (canned tomatoes)	130			
Total nutrients		35.0	140.4	253.6
Nutrients per 1,000 calories		14.4	58.0	104.8

[1] The maize meal, wheat farina, rice, cowpeas (previously coarsely ground), and sodium chloride are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in and the total weight is brought to 2,000 grams with water. The finished mixture is served to the dog in suitable calorie portions.
[2] Whole white maize meal, sifted as for human consumption.
[3] For origin see text.

TABLE 11.—*Composition of butterfat diets No. 180A*[1], *No. 180B*[1], *and No. 180C*[1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal [2]	300	25.4	14.1	222.0
Wheat germ (ether-extracted)	25	7.3		15.7
Casein (purefied) [3]	32	28.0		
Milledgeville butterfat (in diet No 180A) / Vermont butterfat (in diets No. 180B and No. 180C)	115		115.0	
Cod-liver oil	5		5.0	
Salt mixture [4]	18			
Tomato juice (in diets No. 180A and No 180B only)	130			
Total nutrients		60.7	134.1	237.7
Nutrients per 1,000 calories		25.2	55.8	99.0

[1] The maize meal and wheat germ are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in (omitting the tomato juice in the case of diet No. 180C) and the final weight is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). The mixture is served to the dog in suitable calorie portions.
[2] Whole white maize meal sifted as for human consumption.
[3] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15).
[4] After Osborne and Mendel (16).

TABLE 12.—*Composition of cottonseed oil diet No. 302* [1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal [2]	310	23.3	13.0	204.0
Casein (purified) [3]	80	72.5	.5	
Cottonseed oil (Wesson oil)	110		110.0	
Cod-liver oil	10		10.0	
Salt mixture [4]	21			
Total nutrients		95.8	133.5	204.0
Nutrients per 1,000 calories		39.9	55.6	85.0

[1] The maize meal and salt mixture are stirred into water and cooked 1½ hours. The other ingredients are then well stirred in and the final weight is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). The mixture is served to the dog in suitable calorie portions.
[2] Whole white maize meal, not sifted.
[3] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15).
[4] After Osborne and Mendel (16).

TABLE 13.—*Composition of beef diets No. 196*,[1] *No. 196A*,[1] *and No. 196B*[2]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Corn meal [3]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*)	50	10.7	.7	30.4
Beef muscle: [4]				
Fresh for diet No. 196 / Dried for diets No. 196A and No. 196B	233 / 64	52.3	6.8	
Sucrose	32			32.0
Cottonseed oil	23		23.0	
Cod-liver oil	15		15.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		96.6	64.3	358.4
Nutrients per 1,000 calories		40.2	26.7	149.3

[1] The maize meal, cowpeas (previously coarsely ground), and sodium chloride are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in and the total weight is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). This finished mixture is served to the dog in suitable calorie portions.
[2] In preparing diet No. 196B, the dried beef is cooked with the maize meal, cowpeas, and salt. In all other respects the preparation is as for diets No. 196 and No. 196A.
[3] Whole white maize meal sifted as for human consumption.
[4] Lean round steak. For preparation see text.

TABLE 14.—*Composition of pork liver diet No. 292*[1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Pork liver (dried)[2]	64	43.5	7.8	4.7
Corn meal[3]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*)	50	10.7	.7	30.4
Casein (purified)[4]	10	8.9		
Sucrose	25			25.0
Cottonseed oil	26		26.0	
Cod-liver oil	12		12.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		96.7	65.3	356.1
Nutrients per 1,000 calories		40.2	27.2	148.3

[1] The dried pork liver, maize meal, cowpeas (coarsely ground), cottonseed oil, and sodium chloride are stirred into water and cooked about 1½ hours. Then the other ingredients are well stirred in and the final weight of the mixture is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). This finished mixture is served to the dog in suitable calorie portions.
[2] For method of preparation see text.
[3] Whole white maize meal sifted as for human consumption.
[4] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15).

TABLE 15.—*Composition of canned chum salmon diet No. 294*[1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Canned chum salmon[2]	300	64.4	22.2	
Cornmeal[3]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*)	50	10.7	.7	30.4
Sucrose	17			17.0
Cottonseed oil	12		12.0	
Cod-liver oil	12		12.0	
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		108.7	65.7	343.4
Nutrients per 1,000 calories		45.2	27.3	143.0

[1] The maize meal, cowpeas (coarsely ground), and sodium chloride are stirred into water and cooked about 1½ hours. The other ingredients are then well stirred in and the final weight is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). This finished mixture is served to the dog in suitable calorie portions.
[2] The entire contents of the can are used.
[3] Whole white maize meal, sifted as for human consumption.

TABLE 16.—*Composition of egg yolk diet No. 293B*[1]

[Total calories, 2,400]

Articles of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
	Grams	*Grams*	*Grams*	*Grams*
Egg yolk (dried)[2]	100	33.9	60.9	
Corn meal[3]	400	33.6	18.8	296.0
Cowpeas (*Vigna sinensis*)	50	10.7	.7	30.4
Casein (purified)[4]	15	13.3		
Sodium chloride	10			
Calcium carbonate	3			
Total nutrients		91.5	80.4	326.4
Nutrients per 1,000 calories		38.1	33.5	136.0

[1] The dried egg yolk, maize meal, cowpeas (coarsely ground), and sodium chloride are stirred into water and cooked for about 1½ hours. Then the other ingredients are well stirred in and the final weight is brought to 2,400 grams with water (so that 1 gram represents 1 calorie). This food mixture is served to the dog in suitable calorie portions.
[2] For method of preparation see text.
[3] Whole white maize meal sifted as for human consumption.
[4] Commercial casein leached for a week in daily changes of acidulated water, after McCollum (15).

PUBLIC HEALTH ENGINEERING ABSTRACTS

German Developments in Refuse Disposal. John H. D. Blanke. *The American City*, vol. 38, No. 2, February, 1928, pp. 87–89. (Abstract by J. B. Harrington.)

The developments of refuse disposal in Germany since 1893 are set forth briefly in this article. The shaft furnace in which heavy layers of refuse are burned was first developed at Hamburg. Other recent and successful developments are the removal of combustion residues by machinery, and, in 1925, the installation of fire-tube boilers in combination with the furnace unit. At the Hamburg plant, consisting of 12 furnace units, four of which are equipped with fire-tube boilers, one of the units was replaced with a furnace provided with a grate-residue remover and a vertical-tube boiler. Tests on this unit indicate that it will handle 80 tons of refuse per 24 hours, as compared to 30 tons per 24 hours for the old units. Further successful developments along this line are an increased grate area, a slack-forming zone of water-cooled iron surface covered with stone, the vibrating or oscillating blower, and the air heater. Combustion usually lasts about 20 minutes. The flue gases pass through the ashing chamber, where they are burned further, and then successively through a fire-tube boiler, a flue chamber with steam superheater, two horizontal flue-tube boilers, a second flue chamber, electric filter, and chimney. The by-products of the plants are 45 to 50 per cent slack; 1 per cent old iron, 0.7 per cent magnetic slack, 5 to 20 per cent flying ash, 0.55 to 3.3 pounds steam per pound of refuse, 353 to 530 cubic feet of hot water at 122° F. in one hour from one furnace unit.

House Refuse Collection, E. H. Radcliffe. *The Surveyor*, vol. 73, No. 1888, March 30, 1928, pp. 375–376. (Abstract by H. N. Old.)

In this paper, presented at a recent meeting of the Royal Sanitary Institute held at Taunton, the various methods of house storage of refuse are discussed. The ash pit is a requirement in some jurisdictions, although the more common types of tubs, buckets, and boxes are in general use. The evils of curb-side collection are given and coincide with similar conditions in the United States.

The desirability of the collection from the rear of the premises is stressed, despite the factor of additional cost of this service. The author advocates a system of collection somewhat identical with the trailer method used rather generally throughout this country in the larger communities.

Another method described is that of yard collection, but allowing the loaders, usually two men, to carry the containers to the curb while the van goes to the disposal ground. In this way much time is saved and the loaders can usually judge the number of premises they may serve while waiting for the return of the van to pick up the material lined up at the curb.

At Taunton the town is divided into 15 districts, and three electric vehicles and a 30-hundredweight "Morris lorry" are used for curb-side collection. The schedule for a week is given as example of the system and indicates that the collection of refuse and scavenging is taken care of by the same outfits by systematic apportionment of the time.

Refuse Disposal as a Factor in National Economy. F. D. Ogden. *The Journal* of the Institution of Municipal and County Engineers, vol. 54, No. 15, January 24, 1928, pp. 971–979. (Abstract by Harriet S. Ryan.)

Salvage operations properly conducted attain the object of definitely disposing, in a hygienic manner, of objectionable refuse, and, in addition, open up an appreciable source of revenue. Tipping and other insanitary methods of disposing of refuse are fast passing, giving place to the refuse destructor. Refuse is not actually destroyed, but merely changed in form so as to be rendered innocuous. It is the salvage of refuse so dealt with which has prompted the

writer to make these notes. He quotes the law relating to scavenging in general as set out in the public health act of 1875. He endeavors to encourage interest in the subject by means of examples of the various residuals it is possible to obtain from the average refuse of a town of 30,000 inhabitants.

Before embarking upon a salvaging scheme, it is necessary to institute tests to ascertain the average amount of the various components, which vary considerably according to locality, season, etc. The refuse is sorted and the salable material is sent to the necessary salvage plant, while all which should be burned is committed to the furnace. Every available particle of refuse is utilized.

In following the various materials to the respective salvage plants and indicating the possibilities of salvage, the writer reviews that aspect of scavenging dealing with the ultimate disposal of refuse in such a manner as to obviate some of this waste by its utilization, in changed form, for various purposes.

Water Supply, Sewage Treatment, and Refuse Disposal in 1927. H. B. Cleveland. *Public Works*, vol. 59, No. 1, January, 1928. pp. 14–18. (Abstract by R. J. Faust.)

Refuse disposal.—The trend has been almost wholly to construct incinerators rather than build reduction plants or develop hog farms.

The Buffalo, Los Angeles, Toledo, Birmingham, Philadelphia, and New York City incinerator installations have been the more recent notable plants. At Cleveland a reduction plant is being planned, and at Indianapolis the reduction plant started operation within the year.

Treatment of Packing-Plant Wastes. Frederick G. Nelson. *The Canadian Engineer*, vol. 53, No. 25, December 20, 1927, pp. 627–629. (Abstract by R. E. Thompson.)

A description of the activated sludge plant operated by the Iowa State College Engineering Experiment Station at the packing works of J. E. Decker & Son, Mason, Iowa, with an outline of operating experiences. The plant consists of a Dorco rotary screen, primary settling tank, two aeration tanks, secondary settling tank, and a sludge reaeration tank. Both settling tanks are of the Dorr type, equipped with thickeners. The average hourly flow varied from 200–490 gallons per minute, dropping to 125 gallons per minute on Sundays. During periods of low flow, difficulties were experienced, due to the primary settling tanks becoming septic, this condition giving rise to disturbances in the purification process. With a sludge return of 50 gallons per minute, the theoretical detention period in the sludge reaeration tank is five and one-half hours. This tank, which was installed after the plant had been in operation some time, has effected a great improvement. The short period of aeration has little effect, however, when the sludge is septic. Increasing sludge return to 150 gallons per minute by returning sludge directly to the aeration tank during low flow periods has been found to facilitate the building up of a large amount of sludge for use when the flow increases.

One of the most troublesome factors encountered has been the rising of sludge in the final settling tank. This occurs when the sludge is under or over aerated or slightly septic. Applying a continuous spray of water to the scum formed has been partially successful in causing the sludge to resettle. Carefully controlling the air supply is the best method of combating this condition.

On some days extreme foaming has occurred in the aeration tanks, the foam at times covering the tanks to a depth of 6 feet and the ground to depth of 1 to 4 feet for a distance of 50 feet. Foaming apparently occurs at certain intervals when the tanks are changing from an underaerated to a fully aerated condition. Probably the most effective remedy would be either the use of oil in the tanks or the application of a flat, horizontal spray of water which would tend to cut the foam.

To correct unequal distribution of air, the tanks were dewatered and cleaned. A heavy deposit of sand and organic matter was found on the entire bottom of the aeration tanks to a depth of 4–6 inches. The filtros plates were cleaned by scrubbing, soaking in hydrochloric acid (specific gravity 1.14), and finally washing with hot water applied through a nozzle under pressure. The method employed for testing the loss of head through the plates before replacing them is outlined.

Experiments have been carried out on dewatering the sludge with an American continuous filter. The primary sludge, which contains 6 per cent dry solids, when treated with 10 pounds of alum per 1,000 gallons, filters readily to 71 per cent moisture. A few determinations have indicated an erratic solid content in the activated sludge varying from 0.25 to 1.5 per cent. A mixture of 75 per cents activated and 25 per cent primary sludge treated with 5 pounds of alum per 1,000 gallons gave a cake with 75 per cent moisture or a little higher. A few tests with ferric chloride also gave good results, but the moisture content of the cake was somewhat higher. The mixture of sludges filters more rapidly than the ordinary sludge alone. It is not expected that the plant will be able to treat successfully the wastes during the approaching peak of the killing season.

Water Pollution Control: Cannery Wastes. Homer S. Murphy, J. M. Hepler, and E. F. Eldridge. A Compilation Covering Activities, Experimental Work and Cooperative Investigations as Conducted by the Department of Conservation, Department of Health and the Michigan Canners Association. 18 pages. (Abstract by D. S. Abell.)

The first section of this pamphlet mentions the history of experimental work on canning-factory waste. Previous work done in Michigan was summarized in the statement, "The biological process might be slower than the chemical treatment process, but past experiments indicate that it could be operated efficiently and at less expense." Since 1925 Michigan has had a law which makes it "the duty of the Department of Conservation; * * * to guard against the pollution of lakes and streams within the State and to enforce all laws provided for that purpose with all authority granted by law and to foster and encourage the protecting and propagation of game and fish." Previous investigations at the following places are each reviewed: New Jersey, 1910; Washington, Ill., 1913; Fremont, Mich., Amelia, Ohio, 1916; Columbus, Ohio, Brockport, N. Y., and Poynette, Wis., 1916. Next follows a condensed report of the operation of the Michigan Canners Association experimental waste treatment plant located at the W. R. Roach & Co.'s plant at Kent City. Members of the association voted to assess themselves a sum of 0.2 of a cent per can based on the 1925 pack for the purpose of studying the problem. The plant consisted of fine screens, "which every canning plant should have," settling tanks, one of which could be used for digestion; and filter beds of different types. Sprinkling filters gave quite satisfactory results. The intermittent sand filters, however, showed a tendency to form a hard crust. Cinder filters will be abandoned. The small amount of sludge obtained indicates the possibility of supplanting the tanks with fine screens. A grit chamber may help. A portable plant is planned. It is hoped that after the next (1927) season definite recommendations can be made to the industry with reference to treatment of all canning wastes.

Sprinkling Filter Planned for Expansion. Henry R. Buck. *The American City*, vol. 38, No. 2, February, 1928, pp. 107–108. (Abstract by J. B. Harrington.)

Watertown, Conn., has an area of 18,750 acres; population of the town is 6,000, and of the district 2,000. The wastes to be treated are almost entirely of domestic nature. The plant is designed to handle 200,000 gallons per day, with an ultimate flow of 500,000 gallons. The tank with two units each 20 by 39

feet, 8 inches square, has been constructed. Each unit has an 8-inch sludge line. The total sludge capacity is 11,880 cubic feet, or 5.9 cubic feet per capita. Gas vents are a minimum width of 1 foot 6 inches, giving 30 per cent of the total area. Each tank has two flow chambers, with a minimum capacity of 9,750 gallons. The retention period when all chambers are in use is 2¼ hours. Two grit chambers each 5 feet 2 inches by 2 feet 6 inches by 7 feet deep with removable racks, have been constructed at the end of the 20-inch line. The sludge bed was built in two sections, each with 2,175 square feet area. Two siphon chambers operating on 8.7-foot head have been provided. The sprinkling filters, only one of which has been constructed, are 110 feet by 75 feet 3 inches, with ⅞-inch nozzles on 13-foot centers. During the winter months construction was carried on by the use of calcium chloride. The cost of the treatment plant was $80,000, and the cost of 17,964 feet of sewer was $75,000.

The Administration of the Milk and Dairies Order, 1926. W. O. Coates. *Journal Royal Sanitary Institute*, vol. 48, No. 8, February, 1928, pp. 462–469. (Abstract by H. A. Whittaker.)

This article gives a general discussion of the administration of the Milk and Dairies Order of England (passed in 1926) which regulates dairy premises and their supervision by the sanitary authority.

For purposes of administration, the author makes several divisions of the order as follows: (1) The two administrative authorities; (2) the administrative officers; i, e., the veterinary inspector, the medical officer of health, and the sanitary inspector. Divisions may be formed for grouping the duties of these authorities and officers; (3) the sanitary inspector being responsible for the administration of the greater portion of the order, this portion is divided to emphasize his varied duties, thus: (*a*) Office administration, (*b*) general routine dairy requirements, (*c*) special requirements applicable to cow keepers, (*d*) constructional requirements, (*e*) distributional routine requirements.

Only the topics contained under No. 3 are taken up in this paper. The author outlines the various requirements and gives a brief interpretation and discussion of each. Brief discussions of certain parts of the order by persons interested in its administration are appended to the article.

Connecticut Standard Test for Dirt in Milk. Friend Lee Mickle. Connecticut *Health Bulletin*, vol. 42, No. 2, February, 1928, pp. 27–30. (Abstract by W. H. Haskell.)

The author points out that the standard disks prepared according to the Standard Methods of Milk Analysis of the American Public Health Association were found to be inadequate as a guide for Connecticut. Laboratory results from various State laboratories were not uniform with results of tests. Standard Methods is also criticized for not specifying certain specific apparatus to be used in making the test. It is also stated that the sizes of the particles of dirt on the different standards varied greatly, and that the kind of dirt used in different laboratories varied in color to a greater extent than had previously been thought possible. An additional photograph of disks has been adopted (in addition to photographs shown on page 33 of fifth edition of Standard Methods) showing 0.25, 0.50, 0.75, and 1 milligram of dirt per pint and the Wisconsin or Lorenz model of sediment tester chosen as the standard. The exact method of carrying out the adopted test is included in the article.

The Purification of Contaminated Oysters in Natural Waters. Charles Krumwiede, William H. Park, Georgia Cooper, Marie Grund, Charles Tyler, and Carolyn Rosenstein. *American Journal of Public Health*, vol. 18, No. 1, January, 1928, pp. 48–52. (Abstract by F. O. Almquist.)

An interesting article on the investigation of the cleansing effect of changing sea water on contaminated oysters. Two lots of freshly dredged oysters were

obtained, one lot from waters where the experiment was to be carried out and the other from distant waters. Each lot was equally divided, one batch of each lot being lightly contaminated and the other heavily contaminated. They were then placed in the natural water for the test. The area in which the tests were made was located near condemned oyster beds. The viability of *B. typhosus* in sea water was also determined.

From the tables compiled it was shown that *B. typhosus* survives roughly 2 to 3 weeks in oysters and 3 weeks in sea water.

It is believed that contaminated oysters transferred to new water would require for purification about the same time equal to the length of time of survival of *B. typhosus* in sea water. It is then concluded that an ordinance allowing the transfer of oysters from questionable to clean waters providing no dredging be allowed for four weeks after the transfer would give a good margin of safety.

An Investigation into the Effect of Pasteurization on the Bovine Tubercle Bacillus in Naturally Infected Tuberculous Milks. L. J. Meanwell. *The Journal of Hygiene*, vol. 26, No. 4, October, 1927, pp. 392–402. (Abstract by W. D. Tiedeman.)

Results obtained by other workers in studying the effect of Pasteurization upon the tubercle bacillus in milk, either naturally or artificially infected, are reviewed. The author points out that apparent differences may be due in part to a greater virulence of the organisms in naturally infected milk. He also considers the possibility of latent infections, and in his experimental work kept guinea pigs 100 days or more.

He Pasteurized separately, in special laboratory apparatus designed to heat every particle of the milk to a uniform and accurately determined temperature, the naturally infected milk from 3 cows known to be suffering from tuberculosis of the udder. The milk from cow No. 1 was abnormal in appearance, a flocculent mass separating out on standing. The milk from the other two cows was normal, although slightly darker in color at times.

The centrifugalized deposit and cream from Pasteurized, naturally infected milk was injected into guinea pigs with the following results: Two pigs out of 284 injected developed tuberculosis with milk treated at 145° F. for 30 minutes, 140° F. for 30 minutes, and 140° F. for 20 minutes, respectively, whereas 10 pigs out of 12 injected developed tuberculosis with milk treated at 138.8° F. for 20 minutes. Coagulated material collecting on the cooler in some of the experiments was ground up with saline and injected into guinea pigs with the following results: Two pigs out of 44 injected developed tuberculosis with material from milk treated at 145 ° F. for 30 minutes and at 140° F. for 20 minutes. None of the 6 pigs injected with this material from milk treated at 138.8° F. for 20 minutes developed tuberculosis.

The author mentions collecting control samples, but gives no results, leaving an open question as to the significance of the large number of negative results obtained with Pasteurized milk.

DEATHS DURING WEEK ENDED MAY 26, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended May 26, 1928, and corresponding week of 1927. (From the Weekly Health Index, May 31, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended May 26, 1928	Corresponding week, 1927
Policies in force	71, 266, 788	67, 772, 503
Number of death claims	15, 183	11, 919
Death claims per 1,000 policies in force, annual rate	11. 1	9. 2

Deaths from all causes in certain large cities of the United States during the week ended May 26, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 31, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended May 26, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended May 26 1928 [2]
	Total deaths	Death rate [1]		Week ended May 26, 1928	Corresponding week 1927	
Total (67 cities)	7,959	13.9	12.5	800	731	65
Akron	39			3	4	33
Albany [3]	37	16.1	11.3	5	4	102
Atlanta	72	14.8	15.7	7	5	
White	32		11.9	1	1	
Colored	40	(4)	24.7	6	4	
Baltimore [3]	218	13.7	11.7	26	18	83
White	159		10.1	19	10	76
Colored	59	(4)	21.2	7	8	110
Birmingham	82	19.3	14.6	10	8	86
White	37		12.2	1	4	14
Colored	45	(4)	18.5	9	4	203
Boston	250	16.4	13.4	38	38	105
Bridgeport	29			4	2	73
Buffalo	154	14.5	13.9	24	14	103
Cambridge	41	17.0	9.7	2	1	36
Camden	37	14.3	14.5	2	5	32
Canton	24	10.7	11.0	2	3	48
Chicago [3]	746	12.4	12.5	71	79	61
Cincinnati	160	20.2	13.8	18	8	100
Cleveland	240	12.4	9.9	16	20	43
Columbus	84	14.8	10.9	6	3	56
Dallas	46	11.1	13.6	5	10	
White	38		12.2	5	7	
Colored	8	(4)	22.8	0	3	
Denver	89	15.8	12.1	9	4	
Des Moines	38	13.1	11.6	2	1	33
Detroit	318	12.1	12.5	37	52	57
Duluth	32	14.3	11.4	2	1	47
El Paso	35	15.5	11.5	10	4	
Erie	34			4	3	82
Fall River [3]	38	14.8	13.4	0	5	0
Flint	33	11.6	10.6	8	5	102
Fort Worth	26	8.1	8.9	3	6	
White	19		8.7	1	5	
Colored	7	(4)	10.6	2	1	
Grand Rapids	27	8.6	11.6	0	6	0
Houston	63			12	6	
White	41			6	3	
Colored	22	(4)		6	3	
Indianapolis	96	13.1	12.7	9	4	69
White	82		12.2	7	4	61
Colored	14	(4)	16.3	2	0	121
Jersey City	92	14.8	10.4	10	7	75
Kansas City, Kans.	26	11.5	11.1	1	2	21
White	20		10.8	1	1	25
Colored	6	(4)	12.3	0	1	0
Kansas City, Mo.	100	13.4	16.1	9	17	64
Knoxville	38	18.9	15.3	5	5	109
White	32		10.4	5	2	121
Colored	6	(4)	51.3	0	3	0
Los Angeles	239			21	29	60
Lowell	44	20.9	12.3	5	2	105
Lynn	32	15.9	12.4	2	1	50
Memphis	73	20.1	17.2	9	4	105
White	40		13.1	7	3	131
Colored	33	(4)	24.7	2	1	63
Milwaukee	122	11.7	11.2	21	19	94
Minneapolis	92	10.6	10.8	13	7	78
Nashville	41	15.5	18.5	2	0	31
White	19		14.8	1	0	21
Colored	22	(4)	28.1	1	0	60
New Bedford	28	12.2	8.7	4	5	87

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, May 25, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended May 26, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 31, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended May 26, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended May 26 1928
	Total deaths	Death rate		Week ended May 26, 1928	Corresponding week 1927	
New Haven	48	13.4	13.8	3	3	42
New Orleans	168	20.5	21.6	17	18	82
White	93		17.9	11	11	80
Colored	75	(4)	32.1	6	7	87
New York	1,671	14.5	11.7	174	136	70
Bronx borough	201	11.0	9.4	21	14	63
Brooklyn borough	578	13.1	10.7	53	50	53
Manhattan borough	665	19.8	15.9	85	58	101
Queens borough	172	10.5	7.6	9	11	36
Richmond borough	55	19.1	12.4	6	3	108
Newark, N. J	114	12.6	10.6	7	13	36
Oakland	70	13.4	9.0	5	3	54
Oklahoma City	41			1	3	
Omaha	65	15.3	10.7	5	2	58
Paterson	30	10.8	14.1	4	4	69
Philadelphia	541	13.2	11.6	49	36	66
Pittsburgh	218	17.0	14.4	27	20	88
Portland, Oreg	79			3	10	32
Providence	79	14.4	12.6	7	5	61
Richmond	44	11.8	14.4	5	3	65
White	25		11.9	2	2	41
Colored	19	(4)	20.6	3	1	110
Rochester	85	13.5	14.0	5	13	41
St. Louis	228	14.1	13.5	13	10	43
St. Paul	55	11.4	12.9	6	8	57
Salt Lake City [3]	25	9.5	10.4	4	2	65
San Antonio	87	20.9	16.3	19	16	
San Diego	37	16.2	21.7	1	1	19
San Francisco	150	13.4	13.5	9	11	57
Schenectady	19	10.6	12.3	2	4	63
Somerville	29	14.8	8.7	2	2	69
Spokane	31	14.9	18.2	1	3	26
Springfield, Mass	45	15.7	9.6	4	3	63
Syracuse	52	13.6	12.4	3	2	36
Tacoma	16	7.6	9.2	1	0	26
Toledo	89	14.9	15.2	7	13	67
Trenton	56	21.1	10.7	8	2	136
Utica	25	12.5	14.6	0	4	0
Washington, D. C	144	13.6	11.3	10	10	57
White	102		9.9	5	5	41
Colored	42	(4)	15.3	5	5	92
Waterbury	20			2	3	58
Wilmington, Del	31	12.6	9.1	4	3	105
Worcester	68	18.0	17.9	3	4	36
Yonkers	23	9.9	8.3	0	1	0
Youngstown	25	7.5	9.8	2	3	27

[3] Deaths for week ended Friday, May 25, 1928.

[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32, Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State, or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 2, 1928, and June 4, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 2, 1928, and June 4, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927
New England States:								
Maine	10	1	8	3	78	36	0	0
New Hampshire	-------	-------	-------	-------	11	-------	0	-------
Vermont	-------	-------	-------	-------	53	77	0	0
Massachusetts	50	80	102	3	720	331	2	2
Rhode Island	5	10	-------	-------	217	1	0	0
Connecticut	27	26	13	4	351	44	3	0
Middle Atlantic States:								
New York	287	427	[1] 53	[1] 12	4,133	1,025	22	9
New Jersey	142	111	10	1	1,796	96	7	1
Pennsylvania	126	168	-------	-------	2,781	791	5	1
East North Central States.								
Ohio	111	-------	87	-------	1,210	-------	6	-------
Indiana	23	23	15	8	477	174	0	0
Illinois	117	124	153	34	208	754	13	10
Michigan	46	74	25	7	974	215	7	3
Wisconsin	15	18	237	14	57	938	2	9
West North Central States.								
Minnesota	17	19	-------	2	74	83	4	3
Iowa	4	14	-------	-------	9	124	1	0
Missouri	21	28	12	-------	425	114	16	0
North Dakota	1	2	12	-------	9	20	0	0
South Dakota	3	2	-------	-------	210	72	0	0
Nebraska	11	5	2	-------	37	116	0	0
Kansas	11	4	2	10	116	597	2	0
South Atlantic States:								
Delaware	2	3	-------	-------	38	8	0	0
Maryland [2]	39	53	9	14	420	22	1	0
District of Columbia	14	16	1	2	215	4	0	0
Virginia	-------	-------	-------	-------	-------	-------	-------	-------
West Virginia	10	12	204	17	72	165	2	0
North Carolina	13	14	-------	-------	439	1,564	0	0
South Carolina	11	9	421	289	231	213	0	0
Georgia	3	10	47	34	104	129	2	1
Florida	6	11	5	4	175	66	0	0

[1] New York City only. [2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 2, 1928, and June 4, 1927—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927
East South Central States:								
Kentucky	7	...	...	...	130	...	0	...
Tennessee	10	5	103	24	117	32	1	1
Alabama	9	24	108	15	202	268	0	1
Mississippi	8	6	...	...	...	...	...	1
West South Central States:								
Arkansas	4	2	147	7	167	72	1	0
Louisiana	14	11	15	13	168	99	1	0
Oklahoma [3]	9	9	89	45	167	245	0	0
Texas	17	16	78	27	246	125	0	0
Mountain States:								
Montana	2	8	8	...	34	16	4	1
Idaho	3	2	...	...	10	37	1	1
Wyoming	1	3	...	...	12	65	0	0
Colorado	...	12	...	...	...	264	...	0
New Mexico	2	5	...	...	59	78	0	0
Arizona	1	1	...	...	9	22	0	0
Utah [2]	2	11	10	...	1	26	0	1
Pacific States:								
Washington	16	8	...	...	67	344	1	4
Oregon	5	7	3	7	38	221	0	0
California	74	117	29	12	90	927	3	8

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927
New England States:								
Maine	1	0	25	15	0	0	4	2
New Hampshire	0	1	2	...	0	...	0	...
Vermont	0	0	9	16	0	0	0	0
Massachusetts	4	3	178	340	0	0	4	4
Rhode Island	0	0	24	13	0	0	0	0
Connecticut	1	0	42	68	1	0	0	0
Middle Atlantic States:								
New York	1	0	432	619	3	7	3	18
New Jersey	0	0	165	240	0	0	1	5
Pennsylvania	1	1	344	432	15	1	11	27
East North Central States:								
Ohio	2	...	207	...	23	...	5	...
Indiana	0	0	70	136	87	181	1	5
Illinois	1	2	231	194	70	23	4	9
Michigan	1	0	156	258	44	31	8	6
Wisconsin	0	2	170	116	19	21	42	0
West North Central States:								
Minnesota	1	8	89	157	3	1	8	7
Iowa	0	0	49	32	44	0	0	1
Missouri	0	0	116	52	33	17	1	6
North Dakota	0	0	23	36	0	1	2	1
South Dakota	0	0	26	23	18	6	0	0
Nebraska	0	1	55	28	24	13	0	0
Kansas	0	0	75	43	73	29	1	2
South Atlantic States:								
Delaware	0	0	2	5	0	0	0	0
Maryland [2]	3	0	55	24	3	0	4	11
District of Columbia	0	0	45	10	0	2	2	1
Virginia	...	0	...	...	...	1	...	...
West Virginia	0	0	20	26	17	26	7	15
North Carolina	1	0	37	10	40	27	8	24
South Carolina	0	2	7	3	1	12	39	73
Georgia	0	0	15	11	0	23	13	65
Florida	2	0	4	6	1	70	18	21
East South Central States:								
Kentucky	0	...	38	...	18	...	2	...
Tennessee	0	0	11	9	23	9	11	22
Alabama	1	0	6	6	23	29	14	39
Mississippi	0	0	5	5	5	4	8	11

[2] Week ended Friday. [3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 2, 1928, and June 4, 1927—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927	Week ended June 2, 1928	Week ended June 4, 1927
West South Central States:								
Arkansas	0	0	16	3	3	13	5	17
Louisiana	1	2	5	3	14	3	16	15
Oklahoma [3]	0	2	42	23	122	31	4	35
Texas	3	1	58	4	37	40	9	24
Mountain States:								
Montana	0	0	10	48	23	8	0	1
Idaho	0	0	4	0	4	10	1	1
Wyoming	0	0	12	19	1	3	7	0
Colorado		0		132		5		5
New Mexico	0	0	20	8	5	2	4	1
Arizona	0	4	0	0	5	0	3	2
Utah [3]	0	0	10	13	1	4	1	0
Pacific States:								
Washington	2	1	22	51	21	36	2	4
Oregon	0	0	12	14	33	8	3	8
California	6	7	148	164	35	16	13	9

[3] Exclusive of Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April, 1928										
Arkansas	2	14	1,088	124	1,310	77	0	64	48	11
California	19	363	146	1	522	6	20	501	91	17
Colorado	29	52	7		502		2	390	34	2
Idaho	6	1	39		10		0	56	41	11
Indiana	1	81	182		1,670		0	399	515	7
Iowa	1	26	4		109		0	274	190	9
Kansas	7	29	24		554		1	730	347	8
Mississippi	2	55	7,191	4,536	7,406	1,029	2	48	35	50
North Carolina	1	116			8,032		3	97	0	10
Oklahoma [1]	10	67	2,564	82	1,621	20	4	204	482	26
Oregon	6	37	145		379		1	40	237	14
Rhode Island	0	44	14		1,297		0	188	0	0
South Carolina	0	74	2,575	541	2,609	398	2	34	41	40
South Dakota	4	8	120		202		1	161	46	4

[1] Exclusive of Oklahoma City and Tulsa.

April, 1928

	Cases
Chicken pox:	
Arkansas	62
California	2,327
Colorado	298
Idaho	47
Indiana	271
Iowa	117
Kansas	438
Mississippi	852
North Carolina	517
Oklahoma [1]	65
Oregon	218
Rhode Island	30

[1] Exclusive of Oklahoma City and Tulsa.

April, 1928—Continued

	Cases
Chicken pox—Continued.	
South Carolina	228
South Dakota	50
Coccidiosis:	
California	4
Dengue:	
Mississippi	4
South Carolina	4
Dysentery:	
California (amebic)	7
California (bacillary)	15
Iowa	12

April, 1928—Continued

	Cases
Dysentery—Continued.	
Kansas (amebic)	1
Mississippi (amebic)	47
Mississippi (bacillary)	268
Oklahoma [1]	9
German measles:	
California	1,450
Colorado	43
Kansas	29
North Carolina	36
Rhode Island	3
Hookworm disease:	
California	2
Mississippi	208
South Carolina	94
Impetigo contagiosa:	
Colorado	8
Iowa	2
Oregon	6
Leprosy.	
California	2
Colorado	1
Lethargic encephalitis:	
California	5
Colorado	1
Kansas	2
Oregon	2
Mastoiditis:	
Rhode Island	1
Mumps:	
Arkansas	141
California	1,403
Colorado	500
Idaho	47
Indiana	445
Iowa	247
Kansas	747
Mississippi	1,393
Oklahoma [1]	146
Oregon	84
Rhode Island	112
South Carolina	55
South Dakota	17
Ophthalmia neonatorum:	
Arkansas	2
California	1
Mississippi	11
Oregon	1
South Carolina	20
Paratyphoid fever:	
California	1
Oregon	1
South Carolina	4
Puerperal fever:	
Mississippi	36

[1] Exclusive of Oklahoma City and Tulsa.

April, 1928—Continued

	Cases
Rabies in animals:	
California	61
Idaho	5
Mississippi	7
Rhode Island	11
South Carolina	10
Rocky Mounted spotted or tick fever:	
California	1
Idaho	8
Oregon	7
Scabies.	
Colorado	4
Oregon	11
Septic sore throat:	
Kansas	2
North Carolina	12
Oklahoma [1]	7
Oregon	11
Rhode Island	1
South Dakota	2
Tetanus.	
California	6
Colorado	1
Oklahoma [1]	1
Rhode Island	1
Trachoma.	
Arkansas	45
California	14
Mississippi	8
Oklahoma [1]	3
South Dakota	3
Trichinosis:	
California	3
Undulant (malta) fever.	
South Carolina	1
Vincent's angina.	
Colorado	2
Iowa	1
South Carolina	4
Whooping cough.	
Arkansas	65
California	1,200
Colorado	87
Idaho	12
Indiana	122
Iowa	26
Kansas	283
Mississippi	1,899
North Carolina	494
Oklahoma [1]	99
Oregon	19
Rhode Island	20
South Carolina	417
South Dakota	10

ADMISSIONS TO HOSPITALS FOR THE INSANE, FEBRUARY, 1928

Reports for the month of February, 1928, showing new admissions to hospitals for the care and treatment of the insane have been received by the Public Health Service from 85 institutions located in 30 States, the District of Columbia, and the Territory of Hawaii.

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Sixteen of these institutions were corporate or private. These hospitals reported a total of 118,122 patients on February 29, 1928, including those on parole.

The following table shows the numbers of new admissions for the month of February, 1928, by psychoses.

First admissions to 85 hospitals for the insane, February, 1928

Psychoses	Male	Female	Total
Traumatic psychoses	11	0	11
Senile psychoses	112	91	203
Psychoses with cerebral arteriosclerosis	68	35	103
General paralysis	140	28	168
Psychoses with cerebral syphilis	20	10	30
Psychoses with Huntington's chorea	0	4	4
Psychoses with other brain tumor	2	0	2
Psychoses with other brain or nervous disease	20	8	28
Alcoholic psychoses	68	3	71
Psychoses due to drugs and other exogenous toxins	6	3	9
Psychoses with pellagra	6	16	22
Psychoses with other somatic diseases	20	36	56
Manic-depressive psychoses	150	154	304
Involution melancholia	7	24	31
Dementia præcox (schizophrenia)	249	162	411
Paranoia and paranoid conditions	25	17	42
Epileptic psychoses	36	31	67
Psychoneuroses and neuroses	11	22	33
Psychoses with psychopathic personality	23	12	35
Psychoses with mental deficiency	43	29	72
Undiagnosed psychoses	61	55	116
Without psychosis	57	25	82
Total	1,135	765	1,900

Fifty-nine and seven-tenths per cent of the new admissions were males and 40.3 per cent were females, giving a ratio of 148 males per 100 females. The 85 institutions on February 29, 1928, had 62,496 male and 55,626 female patients, the ratio being 112 males per 100 females.

Undiagnosed psychoses constituted 6.1 per cent of the total admissions; dementia præcox, 21.6 per cent; manic-depressive psychoses, 16 per cent; senile psychoses, 10.7 per cent; general paralysis, 8.8 per cent; psychoses with cerebral arteriosclerosis, 5.4 per cent; and 4.3 per cent were recorded as without psychosis.

TYPHOID FEVER IN RUTLAND, VT.

The Secretary of the Department of Public Health of Vermont reports an epidemic of typhoid fever in the city of Rutland, Vt., from March 25 to April 14, 1928, which was traced to a healthy carrier employed in a dairy. There were 15 primary cases, 1 secondary case, and 3 deaths. The carrier was 63 years of age and gave a history of typhoid fever when about 15 years old. Eighteen years ago he developed cholecystitis and was operated upon with the removal of a number of gallstones. Since that time he has been apparently well.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 101 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,650,000. The estimated population of the 95 cities reporting deaths is more than 30,960,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended May 19, 1928, and May 21, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
42 States	1,251	1,573	
101 cities	828	1,034	844
Measles			
41 States	17,939	12,625	
101 cities	8,152	3,602	
Poliomyelitis			
43 States	20	28	
Scarlet fever			
42 States	3,647	4,170	
101 cities	1,532	1,841	1,171
Smallpox			
42 States	1,012	743	
101 cities	145	152	116
Typhoid fever			
42 States	211	345	
101 cities	34	59	55
Deaths reported			
Influenza and pneumonia			
95 cities	1,293	708	
Smallpox			
95 cities	0	0	

City reports for week ended May 19, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine									
Portland	76,400	13	1	0	1	0	4	6	1
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	1	0	2
Manchester	84,000	0	1	0	0	0	3	0	2
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Burlington	[1] 24,089	0	1	0	0	0	0	0	1

[1] Estimated July 1, 1925

City reports for week ended May 19, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND—con.									
Massachusetts:									
Boston	787,000	37	43	23	21	8	113	6	48
Fall River	131,000	0	3	3	1	1	1	1	2
Springfield	145,000	8	2	0	4	6	4	22	4
Worcester	193,000	7	3	2	0	0	21	16	2
Rhode Island:									
Pawtucket	71,000	4	0	1	0	0	16	15	2
Providence	275,000	0	7	7	0	1	222	1	5
Connecticut:									
Bridgeport	(²)	2	5	3	2	1	9	0	5
Hartford	164,000	3	5	8	1	0	33	9	9
New Haven	182,000	13	2	1	0	1	80	19	10
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	5	9	18		0	25	25	16
New York	5,924,000	134	256	298	94	40	2,533	0	291
Rochester	321,000	2	10	2	1	1	89	35	12
Syracuse	185,000	20	5	2		0	134	15	9
New Jersey:									
Camden	131,000	1	5	9	0	0	94	9	6
Newark	459,000	17	12	21	10	1	223	9	17
Trenton	131,000	2	3	1	0	0	17	3	3
Pennsylvania:									
Philadelphia	2,008,000	43	65	49	1	8	1,416	55	48
Pittsburgh	637,000	28	18	18	0	8	98	54	43
Reading	114,000	6	2	1	0	0	42	1	3
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	3	7	7	0	3	26	0	17
Cleveland	960,000	50	21	29	15	6	96	61	32
Columbus	285,000	5	3	3	170	4	114	3	5
Toledo	295,000	10	4	2	6	6	159	4	5
Indiana:									
Fort Wayne	99,900	2	2	2	0	0	6	0	2
Indianapolis	367,000	23	4	3	0	3	150	66	18
South Bend	81,700	0	1	0	0	0	0	0	0
Terre Haute	71,900	3	0	0	0	0	1	0	4
Illinois:									
Chicago	3,048,000	68	74	59	45	18	38	40	166
Springfield	64,700	2	0	0	4	3	1	3	4
Michigan:									
Detroit	³ 1,242,044	38	46	63	12	11	396	19	53
Flint	136,000	9	4	1	0	0	202	15	4
Grand Rapids	156,000	2	2	0	0	1	5	10	7
Wisconsin:									
Kenosha	52,700	13	1	0	2	0	0	0	0
Milwaukee	517,000	51	12	6	8	6	3	22	24
Racine	69,400	1	1	0	0	0	1	0	1
Superior	¹ 39,671	0	0	2	0	0	1	1	3
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	3	0	0	0	4	0	1	1
Minneapolis	434,000	36	15	10	0	3	61	119	11
St. Paul	248,000	13	12	2	0	1	3	17	10
Iowa:									
Davenport	¹ 52,469	1	0	0	0		0	0	
Des Moines	146,000	0	2	0	0		0	0	
Sioux City	78,000	2	1	0	0		6	15	
Waterloo	36,900	10	0	1	0		1	20	
Missouri:									
Kansas City	375,000	28	4	2	1	1	72	79	10
St. Joseph	78,400	1	0	0	0	0	0	2	3
St. Louis	830,000	28	38	31	0	0	370	18	
North Dakota:									
Fargo	¹ 26,403	0	0	0	0	0	0	2	0
Grand Forks	¹ 14,811	0	0	0	0		0	0	

¹ Estimated, July 1, 1925. ² No estimate made. ³ Special census.

City reports for week ended May 19, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
WEST NORTH CENTRAL—continued									
South Dakota:									
Aberdeen	[1] 15,036	0	0	0	0	--------	0	0	--------
Sioux Falls	[1] 30,127	0	1	1	0	--------	0	0	--------
Nebraska:									
Lincoln	62,000	9	1	1	0	0	0	11	0
Omaha	216,000	7	1	2	0	0	0	0	3
Kansas:									
Topeka	56,500	14	1	1	0	0	22	6	0
Wichita	92,500	26	1	0	0	0	38	1	5
SOUTH ATLANTIC									
Delaware									
Wilmington	124,000	0	1	2	0	0	16	3	5
Maryland:									
Baltimore	808,000	79	21	30	3	7	408	56	30
Cumberland	[1] 33,741	1	0	0	1	0	11	0	2
Frederick	[1] 12,035	0	0	1	0	0	15	0	1
District of Columbia:									
Washington	528,000	10	12	12	2	2	234	0	13
Virginia:									
Lynchburg	[3] 38,493	6	0	0	0	0	27	4	4
Norfolk	174,000	1	0	1	0	0	14	7	2
Richmond	189,000	3	1	3	69	0	0	2	3
Roanoke	61,900	4	1	0	0	0	15	2	1
West Virginia:									
Charleston	50,700	0	0	1	0	0	1	0	1
Wheeling	[1] 56,208	10	1	0	2	0	7	2	6
North Carolina:									
Raleigh	[3] 30,371	1	0	0	0	0	21	0	3
Wilmington	37,700	2	0	0	0	0	1	0	0
Winston-Salem	71,800	3	0	0	0	0	12	10	1
South Carolina:									
Charleston	74,100	3	0	0	2	0	5	1	2
Columbia	41,800	15	1	0	0	0	0	14	0
Greenville	[1] 27,311	0	0	0	0	0	[illegible]	2	0
Georgia:									
Atlanta	([2])	14	1	8	7	0	29	9	7
Brunswick	[1] 16,809	0	0	0	0	0	0	1	0
Savannah	94,900	4	0	0	18	0	0	1	0
Florida:									
Miami	[3] 131,286	10	3	0	3	0	1	6	2
St. Petersburg	[3] 47,629	--------	0	--------	--------	0	--------	--------	0
Tampa	102,000	5	0	1	0	0	1	11	2
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	0	1	0	0	0	0	0	4
Louisville	311,000	3	3	1	2	1	110	6	12
Tennessee:									
Memphis	177,000	9	1	1	0	3	7	6	6
Nashville	137,000	4	0	0	0	2	23	2	5
Alabama:									
Birmingham	211,000	13	1	0	89	6	85	3	18
Mobile	66,800	1	0	1	0	0	7	0	1
Montgomery	47,000	5	0	1	2	--------	16	0	--------
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	4	0	1	0	--------	2	1	--------
Little Rock	75,900	2	0	0	3	0	3	14	3
Louisiana:									
New Orleans	419,000	6	6	8	6	4	5	0	15
Shreveport	59,500	0	0	0	0	0	12	1	2
Oklahoma:									
Oklahoma City	([2])	0	0	2	5	1	5	2	1
Tulsa	133,000	17	1	0	0	--------	0	18	--------
Texas:									
Dallas	203,000	13	3	1	0	0	16	0	1
Fort Worth	159,000	8	1	3	1	2	5	0	2
Galveston	49,100	0	0	0	0	0	3	2	0
Houston	[1] 154,954	1	3	3	0	0	19	0	4
San Antonio	205,000	4	0	3	0	0	7	1	5

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended May 19, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
MOUNTAIN									
Montana.									
Billings	[1] 17,971	4	0	0	0	0	0	0	0
Great Falls	[1] 29,883	11	1	0	0	0	4	0	1
Helena	[1] 12,037	0	0	0	0	0	0	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	0
daho									
Boise	[1] 23,042	3	1	0	0	0	0	1	0
Colorado:									
Denver	285,000	37	10	9	--------	1	97	46	8
Pueblo	43,900	15	1	1	0	0	27	0	0
New Mexico:									
Albuquerque	[1] 21,000	2	0	0	0	0	6	0	0
Utah:									
Salt Lake City	133,000	22	3	1	0	2	2	1	2
Nevada.									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington.									
Seattle	(2)	57	5	4	0	--------	51	5	--------
Spokane	109,000	15	2	0	0	--------	0	0	--------
Tacoma	106,000	8	1	1	0	0	9	46	1
Oregon:									
Portland	[1] 282,383	20	5	2	0	0	12	5	4
California:									
Los Angeles	(2)	97	37	30	29	2	16	47	21
Sacramento	73,400	22	2	0	0	0	9	6	3
San Francisco	567,000	54	17	12	2	1	18	27	6

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	3	4	0	0	0	0	0	0	0	5	20
New Hampshire:											
Concord	1	0	0	0	0	1	0	0	0	0	9
Manchester	1	1	0	0	0	1	0	0	0	0	17
Vermont:											
Barre	0	0	0	0	0	0	0	0	0	0	3
Burlington	0	0	0	0	0	1	0	0	0	0	6
Massachusetts:											
Boston	62	67	0	0	0	19	1	1	0	25	273
Fall River	3	3	0	0	0	0	0	0	0	2	35
Springfield	6	9	0	0	0	2	0	0	0	5	54
Worcester	9	7	0	0	0	4	0	0	0	14	61
Rhode Island:											
Pawtucket	1	4	0	0	0	0	0	0	0	0	15
Providence	8	24	0	0	0	4	0	2	1	0	61
Connecticut:											
Bridgeport	10	4	0	0	0	5	0	0	0	4	49
Hartford	4	5	0	0	0	2	1	0	0	5	54
New Haven	6	0	0	0	0	0	0	0	0	22	49
MIDDLE ATLANTIC											
New York:											
Buffalo	19	32	0	0	0	7	1	0	0	31	158
New York	253	356	0	0	0	127	9	9	0	178	1,784
Rochester	13	7	0	0	0	3	0	0	0	13	69
Syracuse	9	2	0	0	0	3	0	0	0	7	75

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended May 19, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
MIDDLE ATLANTIC—continued											
New Jersey:											
Camden	6	3	0	0	0	0	0	0	1	0	35
Newark	24	30	0	0	0	13	0	0	0	27	108
Trenton	2	2	0	0	0	7	0	0	0	3	42
Pennsylvania:											
Philadelphia	88	93	0	0	0	44	4	0	0	77	512
Pittsburgh	30	29	0	0	0	13	1	0	0	28	196
Reading	2	18	0	0	0	1	0	0	0	7	26
EAST NORTH CENTRAL											
Ohio											
Cincinnati	17	53	2	3	0	6	1	0	0	8	146
Cleveland	35	20	0	0	0	22	2	1	1	40	224
Columbus	9	9	2	0	0	5	1	0	0	0	91
Toledo	12	2	3	0	0	7	0	0	0	9	81
Indiana:											
Fort Wayne	3	3	3	0	0	3	0	0	0	0	25
Indianapolis	9	19	13	12	0	5	0	1	0	5	108
South Bend	3	0	1	0	0	0	0	0	0	0	0
Terre Haute	3	1	0	0	0	1	0	0	0	0	18
Illinois:											
Chicago	111	90	2	5	0	51	3	0	0	79	859
Springfield	3	14	0	0	0	1	1	1	0	3	28
Michigan:											
Detroit	86	142	1	6	0	41	2	0	1	87	343
Flint	5	10	1	8	0	2	0	0	0	7	27
Grand Rapids	6	2	1	0	0	2	0	0	0	1	43
Wisconsin:											
Kenosha	3	1	1	0	0	0	0	0	0	2	4
Milwaukee	21	37	1	0	0	6	0	0	0	16	132
Racine	4	4	1	0	0	1	0	0	0	2	17
Superior	2	11	1	0	0	1	0	0	0	0	18
WEST NORTH CENTRAL											
Minnesota:											
Duluth	7	10	1	0	0	2	0	0	0	6	27
Minneapolis	37	31	6	1	0	4	0	0	0	18	109
St. Paul	22	11	3	0	0	4	0	0	0	22	49
Iowa:											
Davenport	1	4	2	3			0	0		0	
Des Moines	6	4	2	14			0	0		0	34
Sioux City	2	0	2	0			0	0		0	
Waterloo	1	3	1	0			0	0		0	
Missouri:											
Kansas City	9	29	1	13	0	1	1	0	0	11	15
St. Joseph	2	3	0	1	0	1	0	0	0	1	33
St. Louis	32	32	3	2	0	14	1	1	1	18	208
North Dakota:											
Fargo	1	0	0	0	0	0	0	0	0	6	9
Grand Forks	0	3	0	0			0	0		0	
South Dakota:											
Aberdeen	2	0	0	0			0	0		0	
Sioux Falls	3	4	1	0			0	0		0	5
Nebraska:											
Lincoln	1	16	1	3	0	0	0	0	0	2	
Omaha	4	11	8	6	0	2	0	0	0	0	56
Kansas:											
Topeka	2	8	0	0	0	0	0	0	0	4	22
Wichita	4	5	1	10	0	1	0	0	0	5	26
SOUTH ATLANTIC											
Delaware:											
Wilmington	4	5	0	0	0	0	0	0	0	0	30
Maryland:											
Baltimore	33	28	0	0	0	17	3	1	1	53	243
Cumberland	0	0	0	0	0	0	0	0	0	0	12
Frederick	1	0	0	0	0	0	0	0	0	0	7
District of Col.:											
Washington	20	43	1	0	0	10	1	0	0	11	146

City reports for week ended May 19, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
Virginia:											
Lynchburg	1	0	0	0	0	2	1	0	0	7	17
Norfolk	1	3	0	1	0	2	0	1	0	0	0
Richmond	2	4	0	0	0	7	0	0	0	0	53
Roanoke	1	0	0	0	0	2	0	0	0	0	19
West Virginia:											
Charleston	1	1	1	1	0	1	0	0	0	0	16
Wheeling	1	0	0	0	0	0	1	0	0	0	23
North Carolina:											
Raleigh	0	4	0	6	0	0	0	0	0	3	13
Wilmington	0	0	1	1	0	0	0	0	0	3	11
Winston-Salem	1	0	4	0	0	3	0	0	0	0	16
South Carolina:											
Charleston	0	0	0	8	0	1	0	1	0	0	21
Columbia	0	3	1	0	0	0	1	0	0	3	7
Greenville	0	0	1	0	0	0	0	0	0	0	4
Georgia:											
Atlanta	3	20	7	0	0	6	1	0	0	2	58
Brunswick	0	0	1	0	0	0	0	0	0	0	5
Savannah	1	0	1	1	0	3	1	0	0	3	32
Florida:											
Miami	0	0	1	0	0	1	0	0	0	3	27
St. Petersburg	0	-------	0	-------	0	0	0	-------	0	-------	12
Tampa	0	0	0	0	0	1	1	1	0	3	19
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	5	0	0	0	1	0	0	0	0	22
Louisville	6	27	0	0	0	0	1	0	0	5	146
Tennessee:											
Memphis	5	2	3	2	0	5	1	2	0	9	66
Nashville	2	3	1	3	0	3	0	0	0	1	38
Alabama:											
Birmingham	2	0	6	1	0	7	2	1	0	3	83
Mobile	0	1	1	0	0	1	0	1	0	0	23
Montgomery	0	0	1	0	-------	-------	1	0	-------	0	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	1	0	0	-------	-------	0	0	-------	4	1
Little Rock	0	28	1	0	0	2	1	0	0	0	-------
Louisiana:											
New Orleans	4	4	1	1	0	10	2	0	0	8	165
Shreveport	0	1	1	9	0	1	0	0	0	0	29
Oklahoma:											
Oklahoma City	0	12	2	10	0	2	0	0	0	0	20
Tulsa	2	3	1	4	-------	-------	0	0	-------	4	-------
Texas:											
Dallas	2	18	3	1	0	3	1	0	0	22	39
Fort Worth	1	5	4	5	0	3	1	0	0	0	35
Galveston	0	0	0	0	0	1	0	0	0	0	11
Houston	1	2	1	3	0	2	1	1	0	0	55
San Antonio	0	0	0	1	0	9	1	0	0	0	66
MOUNTAIN											
Montana:											
Billings	1	0	0	0	0	0	0	0	0	2	5
Great Falls	1	3	1	0	0	0	0	0	0	1	5
Helena	1	0	0	1	0	0	0	0	0	0	1
Missoula	0	0	0	0	0	0	0	0	0	0	1
Idaho:											
Boise	0	0	1	0	0	0	0	0	0	0	5
Colorado:											
Denver	11	11	1	0	0	9	0	0	0	28	87
Pueblo	1	0	0	4	0	2	0	0	0	0	11
New Mexico:											
Albuquerque	0	2	0	0	0	8	0	0	0	0	9
Utah:											
Salt Lake City	2	1	1	10	0	1	0	0	0	17	26
Nevada:											
Reno	0	0	0	3	0	0	0	0	0	0	8

City reports for week ended May 19, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
PACIFIC											
Washington:											
Seattle	8	14	3	1			1	0		2	
Spokane	5	3	5	10			0	0		0	
Tacoma	2	1	3	3	0	0	1	0	0	2	16
Oregon.											
Portland	6	6	7	31	0	2	0	2	0	0	
California:											
Los Angeles	27	13	7	3	0	25	1	0	0	63	259
Sacramento	1	1	0	3	0	2	1	3	0	7	27
San Francisco	15	24	1	1	0	12	1	6	0	7	158

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis: Cases	Poliomyelitis: Deaths
NEW ENGLAND									
Connecticut:									
Bridgeport	1	1	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	23	11	3	6	0	0	1	4	0
Syracuse	0	0	0	0	0	0	0	1	0
New Jersey									
Newark	0	0	0	0	0	0	0	1	0
Pennsylvania:									
Philadelphia	1	0	2	1	0	0	1	0	0
Pittsburgh	4	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	5	2	0	0	0	0	0	0	0
Columbus	0	1	0	0	0	0	0	0	0
Toledo	2	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	0	3	0	0	0	0	0	0	0
Illinois:									
Chicago	17	3	0	0	0	0	0	0	0
Michigan:									
Detroit	2	0	2	0	0	0	1	0	0
Wisconsin:									
Milwaukee	1	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
St. Paul	0	1	0	0	0	0	0	0	0
Missouri:									
Kansas City	0	2	0	0	0	0	0	0	0
St. Louis	11	1	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	1	0	0	0	0	0	0
District of Columbia:									
Washington	1	1	0	0	0	0	0	0	0
South Carolina:									
Charleston	0	0	0	0	0	1	0	0	0
Columbia	0	0	0	0	0	1	0	0	0

City reports for week ended May 19, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
Virginia:											
Lynchburg	1	0	0	0	0	2	1	0	0	7	17
Norfolk	1	3	0	1	0	2	0	1	0	0	0
Richmond	2	4	0	0	0	7	0	0	0	0	53
Roanoke	1	0	0	0	0	2	0	0	0	0	19
West Virginia:											
Charleston	1	1	1	1	0	1	0	0	0	0	16
Wheeling	1	0	0	0	0	0	1	0	0	0	23
North Carolina:											
Raleigh	0	4	0	6	0	0	0	0	0	3	13
Wilmington	0	0	1	1	0	0	0	0	0	3	11
Winston-Salem	1	0	4	0	0	3	0	0	0	0	16
South Carolina:											
Charleston	0	0	0	8	0	1	0	1	0	0	21
Columbia	0	3	1	0	0	0	1	0	0	3	7
Greenville	0	0	1	0	0	0	0	0	0	0	4
Georgia:											
Atlanta	3	20	7	0	0	6	1	0	0	2	58
Brunswick	0	0	1	0	0	0	0	0	0	0	5
Savannah	1	0	1	1	0	3	1	0	0	3	32
Florida:											
Miami	0	0	1	0	0	1	0	0	0	3	27
St. Petersburg	0	-------	0	-------	0	0	0	-------	0	-------	12
Tampa	0	0	0	0	0	1	1	1	0	3	19
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	5	0	0	0	1	0	0	0	0	22
Louisville	6	27	0	0	0	0	1	0	0	5	146
Tennessee:											
Memphis	5	2	3	2	0	5	1	2	0	9	66
Nashville	2	3	1	3	0	3	0	0	0	1	38
Alabama:											
Birmingham	2	0	6	1	0	7	2	1	0	3	83
Mobile	0	1	1	0	0	1	0	1	0	0	23
Montgomery	0	0	1	0	-------	-------	1	0	-------	0	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	1	0	0	-------	-------	0	0	-------	4	1
Little Rock	0	28	1	0	0	2	1	0	0	0	-------
Louisiana:											
New Orleans	4	4	1	1	0	10	2	0	0	8	165
Shreveport	0	1	1	9	0	1	0	0	0	0	29
Oklahoma:											
Oklahoma City	0	12	2	10	0	2	0	0	0	0	20
Tulsa	2	3	1	4	-------	-------	0	0	-------	4	-------
Texas:											
Dallas	2	18	3	1	0	3	1	0	0	22	39
Fort Worth	1	5	4	5	0	8	1	0	0	0	35
Galveston	0	0	0	0	0	1	0	0	0	0	11
Houston	1	2	1	3	0	2	1	1	0	0	55
San Antonio	0	0	0	1	0	9	1	0	0	0	66
MOUNTAIN											
Montana:											
Billings	1	0	0	0	0	0	0	0	0	2	5
Great Falls	1	3	1	0	0	0	0	0	0	1	5
Helena	1	0	0	1	0	0	0	0	0	0	1
Missoula	0	0	0	0	0	0	0	0	0	0	1
Idaho:											
Boise	0	0	1	0	0	0	0	0	0	0	5
Colorado:											
Denver	11	11	1	0	0	9	0	0	0	28	87
Pueblo	1	0	0	4	0	2	0	0	0	0	11
New Mexico:											
Albuquerque	0	2	0	0	0	3	0	0	0	0	9
Utah:											
Salt Lake City	2	1	1	10	0	1	0	0	0	17	20
Nevada:											
Reno	0	0	0	3	0	0	0	0	0	0	8

City reports for week ended May 19, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
PACIFIC											
Washington:											
Seattle	8	14	3	1			1	0		2	
Spokane	5	3	5	10			0	0		0	
Tacoma	2	1	3	3	0	0	1	0	0	2	16
Oregon:											
Portland	6	6	7	31	0	2	0	2	0	0	
California:											
Los Angeles	27	13	7	3	0	25	1	0	0	63	259
Sacramento	1	1	0	3	0	2	1	3	0	7	27
San Francisco	15	24	1	1	0	12	1	0	0	7	158

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis: Cases	Poliomyelitis: Deaths
NEW ENGLAND									
Connecticut:									
Bridgeport	1	1	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	23	11	3	6	0	0	1	4	0
Syracuse	0	0	0	0	0	0	0	1	0
New Jersey									
Newark	0	0	0	0	0	0	0	1	0
Pennsylvania:									
Philadelphia	1	0	2	1	0	0	1	0	0
Pittsburgh	4	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio[1]									
Cleveland	5	2	0	0	0	0	0	0	0
Columbus	0	1	0	0	0	0	0	0	0
Toledo	2	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	0	3	0	0	0	0	0	0	0
Illinois:									
Chicago	17	3	0	0	0	0	0	0	0
Michigan:									
Detroit	2	0	2	0	0	0	1	0	0
Wisconsin:									
Milwaukee	1	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
St. Paul	0	1	0	0	0	0	0	0	0
Missouri:									
Kansas City	9	2	0	0	0	0	0	0	0
St. Louis	11	1	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	1	0	0	0	0	0	0
District of Columbia:									
Washington	1	1	0	0	0	0	0	0	0
South Carolina:									
Charleston	0	0	0	0	0	1	0	0	0
Columbia	0	0	0	0	0	1	0	0	0

City reports for week ended May 19, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
SOUTH ATLANTIC—continued									
Georgia:									
Atlanta	0	0	0	0	1	0	0	0	0
Savannah [1]	0	0	0	0	2	1	0	0	0
Florida:									
Miami	0	0	0	0	2	0	0	0	0
Tampa	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Birmingham	0	0	1	0	0	0	0	0	0
Mobile	0	0	0	0	2	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	2	1	0	0	0	0	0	0	0
Little Rock	0	0	0	0	0	3	0	0	0
Louisiana:									
New Orleans	1	0	0	0	3	2	0	0	0
Shreveport	0	0	0	0	0	1	0	0	0
Texas:									
Dallas	0	0	0	0	0	1	0	0	0
Fort Worth	0	0	0	0	0	1	0	0	0
Houston	0	0	0	0	1	1	0	0	0
MOUNTAIN									
Colorado:									
Denver	0	2	0	1	0	0	0	0	0
PACIFIC									
Washington:									
Tacoma	0	0	0	0	0	0	0	2	0
Oregon:									
Portland	0	0	0	0	0	0	0	0	1
California:									
Los Angeles	2	0	1	0	0	0	0	0	0
San Francisco	0	0	0	0	2	2	1	0	0

[1] Typhus fever: 1 case at Savannah, Ga.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended May 19, 1928, compared with those for a like period ended May 21, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, April 15 to May 19, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927
101 cities	137	179	128	171	123	183	121	174	137	174
New England	131	135	133	95	133	130	113	105	110	153
Middle Atlantic	204	270	172	242	170	272	177	282	204	267
East North Central	116	131	131	137	107	159	109	132	114	160
West North Central	80	141	84	158	78	131	55	135	95	105
South Atlantic	82	135	86	105	88	119	82	115	103	110
East South Central	40	30	45	76	40	76	35	81	20	35
West South Central	124	121	100	173	80	141	92	112	64	50
Mountain	80	188	133	99	80	152	71	99	97	108
Pacific	102	157	56	188	125	110	102	94	120	104

MEASLES CASE RATES

101 cities	1,362	788	1,290	638	1,423	696	1,376	602	1,346	620
New England	1,743	295	1,593	323	1,322	270	1,120	346	1,159	416
Middle Atlantic	1,824	115	1,862	231	2,266	212	2,254	297	2,274	323
East North Central	817	797	728	637	794	564	788	450	680	492
West North Central	986	1,552	1,017	1,225	888	1,522	937	932	1,116	952
South Atlantic	2,358	1,589	1,767	1,017	2,109	1,577	1,704	1,546	1,436	1,537
East South Central	1,536	517	1,521	375	1,132	517	1,082	345	1,237	355
West South Central	380	1,249	396	922	392	877	336	567	268	620
Mountain	761	1,793	840	1,542	752	1,632	1,141	1,300	1,150	906
Pacific	393	2,103	386	1,528	266	1,601	327	1,250	263	1,215

SCARLET FEVER CASE RATES

101 cities	264	302	266	339	258	360	253	340	253	309
New England	264	346	329	402	345	393	317	439	292	432
Middle Atlantic	287	528	312	446	303	540	285	474	279	415
East North Central	272	298	281	289	254	283	265	289	272	267
West North Central	288	342	275	333	218	271	242	319	279	289
South Atlantic	170	161	214	191	175	128	167	148	195	101
East South Central	200	167	209	193	304	183	155	152	190	132
West South Central	164	41	108	33	148	58	184	21	216	33
Mountain	212	932	203	950	274	1,004	115	726	133	986
Pacific	151	209	110	198	153	212	204	201	143	167

SMALLPOX CASE RATES

101 cities	22	33	25	21	14	22	18	21	24	26
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	31	29	28	33	15	28	20	20	22	37
West North Central	60	40	68	38	31	34	43	26	64	48
South Atlantic	12	65	33	18	14	36	21	38	32	36
East South Central	20	162	70	66	15	56	45	56	30	76
West South Central	8	95	28	25	36	33	8	58	60	17
Mountain	168	54	150	9	106	36	159	0	159	45
Pacific	59	97	43	65	31	73	36	91	54	71

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1928 and 1927, respectively.

Summary of weekly reports from cities, April 15 to May 19, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927
101 cities	6	7	4	8	6	10	8	8	6	10
New England	7	0	5	5	2	2	5	5	7	5
Middle Atlantic	6	7	3	5	4	10	2	5	4	6
East North Central	3	3	2	6	3	7	3	3	2	5
West North Central	6	4	6	4	2	2	8	2	2	6
South Atlantic	9	11	7	16	18	18	19	9	7	13
East South Central	15	30	5	30	0	15	20	66	20	56
West South Central	20	12	24	12	28	37	16	25	4	45
Mountain	0	27	0	9	0	18	18	9	0	9
Pacific	3	10	0	18	15	3	31	10	23	10

INFLUENZA DEATH RATES

	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927
95 cities	28	18	32	18	32	13	33	13	29	12
New England	7	12	14	7	21	5	16	14	41	14
Middle Atlantic	26	20	34	21	28	15	31	14	28	10
East North Central	28	11	35	10	36	7	43	10	36	12
West North Central	41	21	31	12	53	8	43	4	18	8
South Atlantic	16	22	30	29	21	16	9	25	16	11
East South Central	68	58	37	37	84	43	73	32	63	43
West South Central	45	30	37	47	25	13	37	13	16	25
Mountain	53	0	44	9	35	9	27	9	27	9
Pacific	14	10	17	21	7	21	17	7	10	0

PNEUMONIA DEATH RATES

	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927
95 cities	198	159	196	143	206	131	210	123	189	110
New England	166	151	138	184	189	140	257	144	207	100
Middle Atlantic	242	199	246	168	264	166	267	151	218	119
East North Central	192	135	215	128	211	121	232	97	222	104
West North Central	155	124	90	56	128	68	120	70	88	58
South Atlantic	181	179	172	153	184	114	89	128	146	148
East South Central	235	160	178	133	214	149	193	128	240	112
West South Central	197	81	189	123	90	115	164	140	123	106
Mountain	106	161	106	188	159	99	133	54	97	63
Pacific	81	97	125	117	74	79	98	114	105	121

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1928 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central	12	10	2,683,500	2,634,500	2,566,400	2,518,500
South Atlantic	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central	7	6	1,048,300	1,028,300	1,000,100	980,700
West South Central	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain	9	9	591,100	581,600	591,100	581,600
Pacific	6	4	2,046,400	1,996,400	1,548,900	1,512,100

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended May 12, 1928.—The following report for the week ended May 12, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.

India.—Bassein, Calcutta, Moulmein, Vizagapatam.
Siam.—Bangkok.
French Indo-China.—Haiphong, Saigon.

Egypt.—Alexandria.
India.—Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon, Tuticorin, Vizagapatam.
French India.—Pondicherry.
China.—Canton, Shanghai, Hong Kong.
Japan.—Osaka.
Kwantung. Dairen.
South Manchuria.—Changchun, Yingkow.

Returns for the week ended May 12 were not received from Colombo, Ceylon; Samarinda, Dutch East India; nor Vladivostok, Union of Soviet Socialist Republics.

CANADA

Provinces—Communicable diseases—Week ended May 12, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended May 12, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal meningitis				2				2
Influenza	23			11	4			38
Lethargic encephalitis				3				3
Poliomyelitis				1				1
Smallpox				15		12	13	40
Typhoid fever	1	1	19	9	1			31

Quebec Province—Communicable diseases—Week ended May 19, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended May 19, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	15	Scarlet fever	70
Diphtheria	30	Smallpox	25
German measles	4	Tuberculosis	43
Influenza	3	Typhoid fever	16
Measles	132	Whooping cough	11

HAITI

Epidemic meningitis—Improved conditions.—Under date of May 26, 1928, the Island of Haiti was reported free from cerebrospinal meningitis, but on May 31 two cases were reported in the interior of the Island.

PERU

Lima—Mortality from all causes and from certain diseases—March, 1928.—During the month of March, 1928, 567 deaths from all causes were reported at the city of Lima, Peru, including deaths from certain diseases as follows:

Disease	Deaths	Disease	Deaths
Cerebrospinal meningitis	14	Measles	6
Gastroenteritis	49	Pneumonia	10
Influenza	19	Tuberculosis	111
Malaria	26	Typhoid fever	8

Population 200,000.

SPAIN

Mortality from all causes and from certain diseases—April–June, 1927.—During the months of April, May, and June, 1927, total mortality from all causes was reported in Spain as follows: April, 1927, 32,241 deaths; May, 1927, 31,541 deaths; June, 1927, 34,419 deaths. Deaths from certain causes were reported as follows:

DEATHS, APRIL TO JUNE, 1927

Disease	April	May	June
Bronchitis:			
Acute	1,930	1,351	1,015
Chronic	905	651	518
Cancer	1,082	1,191	1,279
Diarrhea and enteritis (under 2 years)	1,816	3,586	7,348
Diphtheria	91	74	64
Heart disease	3,246	2,817	2,465
Influenza	530	288	157
Malaria	254	330	433
Nephritis	1,045	865	841
Pneumonia	832	709	515
Puerperal fever	115	94	97
Scarlet fever	29	55	37
Smallpox	2	1	4
Tuberculosis, pulmonary	2,472	2,352	2,135
Meningeal	244	284	261
Other forms	301	344	334
Typhoid fever	244	276	321
Typhus fever	1		
Whooping cough	68	82	88
All causes	32,241	31,541	34,419

Population: 22,390,162.

UNION OF SOUTH AFRICA

Cape Province—Natal—Typhus fever—April 8–14, 1928.—During the week ended April 14, 1928, fresh outbreaks of typhus fever were reported in three districts of the Cape Province and in one district in the Province of Natal. One sporadic case was reported in a European at Durban, Natal, stated to have been imported.

Month of March, 1928.—During the month of March, 1928, 115 cases of typhus fever with 33 deaths were reported in the native population of the Union of South Africa, distributed according to Provinces as follows: Cape Province, cases, 107, deaths, 33; Natal, cases, 2; Orange Free State, cases, 4; Transvaal, cases, 2. In the European population in Natal 9 cases were reported.

VIRGIN ISLANDS

Communicable diseases—April, 1928.—During the month of April, 1928, communicable diseases were reported in the Virgin Islands of the United States as follows:

Disease and island	Cases	Remarks
St. Thomas and St. John:		
Gonorrhea	3	
Pellagra	1	
Syphilis	6	Secondary, 5.
Tetanus	1	
Whooping cough	9	
St. Croix		
Gonococcus	1	
Syphilis	5	Secondary.
Uncinariasis	1	Necator americanus.

YUGOSLAVIA

Communicable diseases—April, 1928.—During the month of April, 1928, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	7	2	Measles	2,070	42
Cerebrospinal meningitis	15	7	Poliomyelitis	2	
Diphtheria	151	32	Scarlet fever	1,134	187
Dysentery	47	1	Tetanus	19	13
Leprosy	2	2	Typhus	10	2
Lethargic encephalitis	1	1	Typhoid fever	129	12

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C, indicates cases; D, deaths, P, present]

Place		Sept. 25–Oct 22, 1927	Oct. 23–Nov. 19, 1927	Nov 20–Dec 17, 1927	Dec 18, 1927–Jan. 14, 1928	Jan. 15–Feb 11, 1928	Week ended— February, 1928		March, 1928					April, 1928				May, 1928	
							18	25	3	10	17	24	31	7	14	21	28	5	12
China:																			
Amoy	C	16																	
	D																		
Canton	C	14	12	1								1	1						
	D	14	11	1								1	1						
Foochow	C	P																	
Hong Kong	C	P																	
Shanghai (settlement and concession)—																			
Foreigners only	C	3																	
Including natives	D	7																	
Swatow	C	P	P																
	D	P	P																
Tientsin	C	2	P	1															
Dutch East Indies: Java—Batavia	C		28	3															
	D		18	3															
India	C	20,160	23,047	25,139	15,377	12,891	2,865	3,647	3,256	4,068	4,546	5,384	5,856	5,529					
	D	10,371	12,863	15,026	8,863	6,750	1,529	1,686	1,755	2,312	2,605	2,931	3,182	3,159					
Bassein	D					1		1	1			4	25	22	20	6	6	9	
Bombay	C		2			1				1	1	1	1						
	D		2							1	1		1	1					
Calcutta	C	101	199	428	176	203		80	99	162	164	190	148	162	163	131			
	D	64	138	281	125	112	35	42	63	101	94	122	114	112	111	97	105	115	
Madras	C	14	13	1	1	2		3	11			7	1	2	5	5	5		
	D	8	7	2	1	4	2	2	7	7		2	1	1	4	5	4	5	
Madras Presidency	C	2,050	3,073	3,702	1,864	4,681	930	839	621	571	510	455	243						
	D	1,055	1,736	2,104	984	2,660	504	457	357	300	280	244	131						
Negapatam	C					4													
	D					6	2	2							1			1	
Rangoon	C	6	2	8	4	6	10	12	3	4	4	7	8	3	5	10			
	D	5	5	6	3	2	8	4	2	4	2	3	6	5	2	7	6	1	

Tuticorin	C	1	------	8	------	------	------	------	------	------	------	------	------	10	43	45	19	8	------
	D	1	37	14	------	------	------	------	------	------	1	------	------	8	26	32	10	3	------
India (French):																			
Chandernagor	C	------	6	10	14	6	2	2	------	1	2	1	------	4	------	------	------	------	------
	D	------	6	10	9	1	2	2	------	1	1	1	------	4	------	------	------	------	------
Karikal	C	------	1	1	8	32	2	2	2	------	------	------	------	------	------	------	------	------	------
	D	------	1	1	4	19	2	1	2	------	------	------	------	------	------	------	------	------	------
Pondicherry	C	------	1	25	11	12	17	10	6	------	------	------	------	1	2	3	2	1	------
	D	------	1	21	12	10	12	4	3	------	------	------	------	1	2	3	2	1	------
Indo-China (see also table below):																			
Saigon	C	1	------	------	3	4	1	5	2	8	27	13	21	35	50	28	23	15	10
	D	------	------	------	1	1	1	1	------	6	19	8	12	20	37	17	12	10	7
Iraq [1]		------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Kwangchow-wan (see table below)		------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Siam	C	18	110	88	110	200	74	59	84	78	53	88	70	80	120	------	------	------	------
	D	11	76	64	80	139	50	38	73	53	39	67	54	58	84	------	------	------	------
Bangkok	C	5	4	3	21	101	23	17	12	8	8	12	16	24	------	30	24	20	17
	D	3	2	2	11	66	12	11	7	6	5	5	12	11	------	13	14	8	6
Straits Settlements: Singapore	C	------	7	5	23	3	------	------	------	------	1	1	------	------	------	------	1	------	------
	D	------	5	4	12	1	------	------	------	------	1	1	------	------	------	------	1	------	------
On vessel:																			
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C	------	------	------	------	------	------	------	------	------	------	------	------	P	------	------	------	------	------
S. S. Tabaristan: At Basra, Iraq	C	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928			February, 1928			March, 1928			April, 1928		
						1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20	21-30
Indo-China (French)—see also table above.																	
Annam	C	3,179	226	126	18	79	95	93	23	36	14	18	18	23	17	11	18
Cambodia	C	251	180	85	72	30	9	15	38	22	51	33	22	92	43	102	51
Cochin-China	C	469	178	100	113	46	119	130	178	113	153	206	217	245	277	316	240
Laos	C	246	67	10	------	------	------	------	------	------	------	------	------	------	------	------	------
Tonkin	C	1,297	1	------	2	1	------	------	------	------	------	------	------	------	1	4	1
Kwangchow-Wan	C	16	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death; Duliam Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928		March, 1928					April, 1928				May, 1928		
							18	25	3	10	17	24	31	7	14	21	28	5	12	19
Algeria (see also table below):																				
Oran	C		2																	
Arabia: Aden	C				19	178	63	45	77	158	189	148	151	163	108	59	53	13	5	
	D				7	104	50	31	26	99	134	135	134	126	97	48	16	16	7	
Plague-infected rats						P	P	P	P											
Argentina:[2]																				
Bahia Blanca district	C			3																
Buenos Aires	C					2													(1)	
Cordoba Province	C	P	P	10	2										5					
Firmat	C			1																
Quilino	C			3																
Rosario	C			4	5	4	1													
Santiago Province	C						1													
Ucacha	C			1																
Azores: St. Michaels Island	C	3	3	3	2	8	1	1	1		1	1		1		2				
	D	1		1	1	4			1		1			1		1				
Brazil:																				
Bahia	C				4	5	4	4					P	2	1					
	D				4	4	2	3												
Porto Alegre	C								2											
Rio de Janeiro	C					4	1	1		1	2	1								
	D					1	2				2	1								
Plague-infected rats						1														
British East Africa (see also table below):																				
Tanganyika	C	P	P	P	P	2			3											
	D					2			3						5					
Uganda	C	99	99	67	79	23	13													
	D	88	96	61	64	18	10													
Canary Islands:																				
Arrecife	D																			1
Las Palmas	C	9		3	3	1	1				2		2							
	D			1	1	1	1													
Teneriffe	C					10														
	D					4														

	D			6	6	2	1	3	1	1	3		2							
Plague-infected rats			3		2	5	1	3	1	1										
China:																				
Hong Kong	C																	1		
Tungliao	D	95																		
Dutch East Indies:																				
Balik-Papan	C				1															
	D				1															
Celebes—Makassar	C		6	2	6	5		1												
	D		6	2	5	5		1												
Java	D	779	829	1,017	754	737	178	149	127											
Batavia and West Java	C	130	132	154	128	137	31	15	24	33	19	18	17	26	13					
	D	129	132	152	128	135	31	15	24	33	19	18	17	26	13					
Cheribon	C			1																
	D			1																
Plague-infected rats									1	2	1		1	1	1	3	2	1	1	
East Java and Madura	C	17	10	8	7	7			1		1	1	2							
	D	17	10	8	7	7			1		1	1	2							
Pasoeroean Residency	C			P																
Surabaya Residency	C			P									1					1		
	D												1					1		
Surakarta Residency	C		P	P																
Ecuador: Guayaquil (see table below):																				
Egypt:																				
Alexandria	C			12	5	2	1													
	D			7	2	2	1													
Beni-Souef	C																4	8	4	14
	D																1	2	4	6
Cairo	C				2															
	D				2															
Maghagha District	C															1				
	D															1				
Minieh Province	C															32	9	7	13	15
	D															5	4		5	2
Suez	C				1	4	3	4	3	3		4	7	3		3	2			1
	D				1	2	3	3	2	1		2	3	4		2	2			1
Plague-infected rats												2								
Tanta	C																			1
	D																			1
Greece:																				
Athens and Piraeus	C	1			3															
	D	1			1															
Mitylene	C	1	3	3																
Patras	C	1	1																	
	D	1	1																	
Hawaii Territory: Hawaii	D						1													

[1] Six cases of plague reported in Buenos Aires, Argentina, before May 14, 1928.
[2] Two cases of plague at Suardi, Argentina, and 3 cases at Loreto, Argentina, were reported June 4, 1928. Not confirmed bacteriologically.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928 18	25	March, 1928 3	10	17	24	31	April, 1928 7	14	21	28	May, 1928 5	12	19
India	C	3,246	3,600	5,518	7,097	12,652	5,188	5,776	6,136	6,074	7,517	6,077	6,634	5,851						
	D	1,792	2,065	3,269	4,925	8,521	3,585	3,999	4,828	4,586	6,031	4,724	5,372	4,780						
Bassein	D	8	4	4	17	8	1	2	4	5	5	5	7	5	4	5	1	3		
Bombay	C	4			3	14	5	14	7	7	4	16	28	21	17					
	D	3			3	9	6	14	7	6	4	11	25	21	15	14	19	21		
Calcutta	C				2															
	D					1									2					
Madras Presidency	C	583	470	791	550	452	142	112	64	53	25	19	13							
	D	298	282	359	206	256	79	72	34	27	18	16	9							
Rangoon	C	11	11	15	17	35	15	16	6	11	5	11	3	11	5	2				
	D	11	11	15	16	30	12	15	6	10	4	9	5	8	5	1	3	5		
Indo-China (see also table below):																				
Saigon	C		1																	
Iraq:																				
Baghdad	C					4		1	1		2	2	1		1	4	4	2	4	
	D					2		1	1		2	2	1		1		4	1		
Dulaim Liwa	C					1									1					
Kwangchow-Wan (see table below).																				
Madagascar (see table below)																				
Mauritius (see table below)																				
Nigeria (see also table below):																				
Lagos	C		17	13	10	10	2	3	2	1	2		2	3	2	6	7	2		
	D		17	13	8	11	2	3	2	1	2		2	3	1	7	7	2		
Peru (see table below)																				
Senegal (see also table below):																				
Baol	C	95	P	P																
	D	40																		
Cayor	C	176	48																	
	D	88	28																	
Dakar	C	1																		
Louga	C	8																		
Thies and vicinity	C	1	1										8							
	D												4							
Siam	C	13	1	3	16	20	13	4	11	14	7	8	13	5	6	11				
	D	9		2	11	12	10	4	10	12	6	9	10	5	4					
Bangkok	C	2			1	2	1						1			3	1			
	D		1		1	2	1						1			2				

Place																				
Straits Settlements: Singapore	C	-----	1	-----	-----	1	1	1	-----	1	-----	1	-----	-----	-----	-----	-----	-----	-----	-----
	D	-----	1	-----	-----	1	1	1	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----
Syria (see table below)		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Tunisia [1]		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Turkey: Constantinople	C	1	-----	2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	D	1	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Union of South Africa:																				
Cape Province	C	-----	2	2	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	D	-----	2	1	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Orange Free State	C	-----	1	8	-----	5	4	1	-----	-----	3	2	-----	-----	-----	-----	-----	-----	-----	-----
	D	-----	1	6	-----	4	1	-----	-----	-----	3	2	-----	-----	-----	-----	-----	-----	-----	-----
Union of Soviet Socialist Republics:																				
Chita district	C	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	D	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Northern Caucasus	C	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Venezuela: State of Miranda—Tacata and Cua	C	-----	-----	-----	-----	-----	-----	-----	-----	P	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
On vessel:																				
S. S. Cadwallen at La Plata, from Rosario, Argentina	C	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
S. S. Aghios Gerasimos, at Vigo, Spain	C	-----	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928
Algeria (see also table above):								
Algiers	C	-----	2	-----	-----	-----	-----	1
Angola	C	-----	3	-----	-----	-----	-----	-----
British East Africa (see also table above):								
Kenya	C	95	62	26	24	19	-----	-----
Ecuador: Guayaquil	C	15	18	4	6	10	-----	-----
	D	-----	5	4	3	1	-----	-----
Plague-infected rats		34	31	23	31	21	-----	-----
Indo-China (French) (see also table above)	C	14	10	7	-----	5	9	-----
Kwangchow-Wan	C	-----	-----			18	3	-----
Madagascar	C	314	692	427	342	-----	-----	-----
	D	286	605	388	317	-----	-----	-----
Ambositra Province	C	7	25	105	67	-----	-----	-----
	D	7	17	96	66	-----	-----	-----
Antsirabe Province	C	39	109	117	108	-----	-----	-----
	D	38	108	117	108	-----	-----	-----
Madagascar—Continued.								
Itasy Province	C	36	104	33	19	-----	-----	-----
	D	41	94	29	17	-----	-----	-----
Moramanga Province	C	12	95	19	25	-----	-----	-----
	D	12	83	19	24	-----	-----	-----
Tananarive Province	C	211	408	155	123	-----	-----	-----
	D	189	354	129	102	-----	-----	-----
Mauritius	C	1	-----	-----	-----	-----	-----	-----
Nigeria (see also table above)	C	32	63	16	16	-----	-----	-----
	D	29	61	16	16	-----	-----	-----
Peru	C	34	34	-----	41	52	-----	-----
	D	19	11	-----	14	9	-----	-----
Callao	D	3	3	-----	-----	-----	-----	-----
Lima	C	-----	7	6	-----	-----	-----	-----
	D	-----	3	-----	-----	-----	-----	-----
Senegal (see also table above)	C	-----	-----	5	17	8	81	-----
	D	-----	-----	-----	13	4	40	-----
Syria: Beirut	C	-----	2	-----	-----	-----	-----	-----

[1] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE RATS ON VESSELS

S. S. *Modemi* at Goteborg, Sweden, from Bahia and Buenos Aires via Cape Verde Islands, December 22, 1927.
S. S. *Gydevore* at Landskrona, Sweden, from Rosario via Canary Islands, January 22, 1928.
S. S. *Dryden* at Liverpool from La Plata River ports, January 20, 1928.

SMALLPOX

[C indicates cases; D, deaths, P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb 11, 1928	Week ended— February, 1928		March, 1928					April, 1928				May, 1928		
							18	25	3	10	17	24	31	7	14	21	28	5	12	19
Algeria (see also table below)	C	683	661	170	129	71	30		28	14	3				12					
Algiers	C			3	9	15	4		5	1		2	2	1		2				
Oran	C	11	20	39	29	11	1		2	2		2	10		3	1	2			
Angola (see table below):																				
Arabia: Aden	C		1	3	1		1													
Brazil (see also table below):																				
Rio de Janeiro	C		1								1									
	D		1								1									
British East Africa (see also table below):																				
Kenya—Mombasa	C											1		1						
Tanganyika	D	P	P	P	8	5														
British South Africa:																				
Northern Rhodesia	C	164	185	252	236	233	79	117	38	63		54	8	5						
	D	11	64	62	31	23	5	32	2	3		9								
Southern Rhodesia	C		3	2	1	3	2	4	P	3	4	1	2		21					
	D							1							10					
Canada:																				
Alberta	C	23	10	10	11	27		3		7	7	20	7	13	4	2	3	3	13	
Calgary	C										1									
Edmonton	C	1	1	8	5	3	1		11	1	1	11	1	7	2			1	12	10
British Columbia: Vancouver	C			4	8	26	2	1	3	4	2	5	6	4	11	6	1	6	4	2
Manitoba	C	7	19	7	11	1												7		
Winnipeg	C	2	2	2	2	2														
New Brunswick	C				1			1												1
Nova Scotia:																				
Halifax	C	1																		
Ontario	C	96	264	247	212	243	40	51	36	20	19	35	20	9	6	18	18	8	15	
Hamilton	C			2																
Kingston	C		1		1	1									2		1			

Ottawa	C	67	134	63	60	68	11	3	1	7	6	8	10	2		3	1		4	2
Toronto	C	10	34	39	28	20	4	4	2	4	2	3	3	1	2	4	4	1	2	7
Windsor	C	9																		
Quebec	C	8	25	16	44	26	11	13		18	22	40	35	15	20	25	4	33		25
Montreal	C		1		8	8	5	1	3		6	3				6	2	1		
Quebec	C			4	5	5		2	5	4	3	4	4	5	4			9		
Riviere du Loup	C		3																	
Sherbrooke	C												3							
Saskatchewan	C	31	34	58	52	97	7	8		7	14	7		12	2	23	15	12	12	
Moose Jaw	C	3		1	4	11		2	6	5	2	5			3					1
Regina	C	5	1	1									1	2	3	2		8	1	
Saskatoon	C			2	4	15		2												
Ceylon: Colombo	C		1	2		4	2	1	3					1						
	D			1		1						1								
China:																				
Amoy	C									1	1	2	1	2	3	2				
Antung	C				1											1		2		
Canton	C									2	3	2		2	1					
Chefoo	C	P		P							P									
	D								1											
Foochow	C	P	P	P	P	P		P		P				P	P	P				
Hong Kong	C				1	2	1	3		3	5	7	10	10	4	4	9	8		
	D				1	2		1	1	2		2	5	12	7	2	10	7		
Manchuria—																				
Changchun	C			1		4									2		1	1		
Dairen	C	1	2	1	5	15	3	4	6		1	3	5	6	7	3	6			
	D	1				8	4	2	1			3	5							
Fushun	C		1																	
Harbin	C			2	1	5	2	1	3	1	2	2		2	2					
Mukden	C	2	1			4	18		3				1			3	1			
Pensihu	C	1																		
Shanghai—																				
Foreigners only	C					5	1	1	1	3	1	1	3	2		1	1			
Including natives	D					11	5	4	4	6	2	1	3	3	3	1	3	2		
Tientsin	C	13	8	9	8	48	5	2	2	11	4	3	3	3	9	1				
Chosen (see table below)																				
Curacao (alastrim)	C					2	3													
Dominican Republic: Santo Domingo	C										2							1		
Dutch East Indies:																				
Borneo—																				
Pontianak	C							1												
Samarinda district	C		P																	
Java—																				
Batavia and West Java	C	4	25			4		1		1	4			1	1					
	D		15																	
East Java and Madura	C	8	9	9	5	2			8	1										
	D	1								1										
Sumatra—Medan	C			3	9	23	7	3	1	3	6			1	2					
	D			2	3	11				2	4			1	2					
	D	1		1										33	6					
Ecuador (see table below)																				

CHOLERA, PLAGUE. SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths, P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928 18	25	March, 1928 3	10	17	24	31	April, 1928 7	14	21	28	May, 1928 5	12	19
Egypt	C			4	4	1		1	1					52	11					
	D	1		1										33	6					
Cairo	C			2		1														
France (see table below)																				
Gold Coast (see table below)																				
Great Britain:																				
England and Wales	C	473	902	1,041	1,175	1,530	369	392	365	347	359	342	322	318	321	326	376	321		
Birmingham	C	1				44	1				1				1					
Bradford	C		11	19	32	24	7	1		4	9		5	5	3	2	7	2	2	
Bristol	C	6	4	8		3			1	3		2	8	2	1	10	1	5	4	
Cardiff	C		1		1								5				1	2		
Castleford	C							1	1	2	2	16	7	11	27	11	20	11		
Leeds	C	7	5	16	11	3	1	2	4	2	3	5	3	3	2	2	1	1		
Liverpool	C				1					1										
London	C					4	10	1	2	1	10	5	1	1	7	5	3	27		
Manchester	C	3	6	25	5	25	1	4	1	2	4	3	3	4	2	4	2		1	
Newcastle on Tyne	C	6	9	55	22	27	4	1	4	3	3	4		2			4			
Nottingham	C				13	27	6	1	3	1	5	1	6	1	4	4	6	3		
Sheffield	C	10	6	9	14	8	1	2	2	1				1		10	2	2	2	
Stoke on Trent	C				4	1	2	4	3	6	11			1	4	10	5	13	9	
Greece (see table below)																				
India	C	3,153	4,052	6,731	10,676	17,777	4,567	4,220	5,251	4,812	6,004	6,169	8,101	7,760						
	D	715	927	1,650	2,429	3,709	1,073	938	949	866	1,212	1,207	1,500	1,621						
Bassein	C					1												1		
Bombay	C	10	4	9	14	61	29	23	46	51	49	58	62	49	56	57	54	33		
	D	2	3	2		24	15	13	23	22	24	33	36	27	32	34	27	25		
Calcutta	C	5	5	25	86	58	9	18	14	30	20	29	45	40	49	51	31	40	41	
	D	6	2	11	27	34	5	11	10	24	15	21	33	35	32	42	21	35	30	
Karachi	C									1	1									
	D									1										
Madras	C	8	7	11	21	74	15	33	21	31	30	27	45	81	49	36	60	24		
	D		2	3	6	8	3	3	3	10	5	3	6	15	16	8	7	7		
Negapatam	C				5	8	1		1	1					1		5	1		
	D				3	3									1		2			
Rangoon	C	17	6	14	186	275	68	82	132	95	96	82	92	50	62	45	37	23		
	D	3	1	4	31	64	22	24	26	32	28	17	34	23	24	17	12	16		

Vizagapatam	C				3	10		1		1			3			2				
	D					8														
India (French):																				
Karikal	C	2	P																	
	D	2																		
Pondicherry	C	38	42	41	65	47			6	3		6	5	7	12		15	9		
	D	38	42	41	50	47			6	3		6	5	7	1		15	9		
Indo-China (see also table below):																				
Saigon	C			1	3			2		1										
Iraq:																				
Baghdad	C	7	5	25	23	19	2		3	2	3	1		1	1	3		1	6	
	D	4	4	14	12	11	1		1	2	3	1			1	1		1	1	
Basra	C	2	3	4	2	1	1		2	4	4	1					1			
	D	2	1	3	1						1	1					1			
Italy:																				
Leghorn	C								1		1									
Palermo	C												3	2	1	3	3			
Rome and vicinity	C					3														
Jamaica (outside Kingston) (alastrim)	C	9	7	3	2	5	1	3		6	3	2	1	7		1	2	1		
Kingston (alastrim)	C	2																		
Japan:																				
Kobe	C																			6
Tokyo	C					4		1		3	1	3	1	10	8					
	D					1			1	1				1	1					
Tokyo Prefecture	C											17	5	2	1					
	D													1	1	1				
Yokohama	C																1			
Latvia (see table below)																				
Mauretania	C						P	P												
Mexico (see also table below):																				
Acapulco	C		1																	
	D		1																	
Chihuahua	D				1															
Jalisco (State)	C								P	P	P	P	P	P	P	P	P			
Guadalajara	D			2					1					2	2	1	4	5	7	4
Manzanillo	D				1						1									
Mexico City and surrounding territory	C			4		2	2													
Saltillo	D																		1	1
Tampico	C							1												
Torreon	D	2																		
Morocco (see table below).																				
Nigeria (see also table below):																				
Lagos	C													1						
Southern Provinces	C								7			40	26	27						
	D											28	1	6						
Palestine: Jerusalem	C			1		1														
	D					1														
Persia (see table below).																				
Poland	C			1	6	3	1				1									
Portugal (see also table below):																				
Lisbon	C	8	4	10	12	12	3	9	4	4			2	3		3	2	1		
	D			1						1										
Oporto	C																1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928		March, 1928					April, 1928				May, 1928		
							18	25	3	10	17	24	31	7	14	21	28	5	12	19
Senegal (see also table below):																				
Dakar	C							8		26	17			12	5	11				
	D										12			8		8				
Siam	C	6	1	9	23	35	1	7	1	3		2	14	12	1					
	D			1	2	4	1	1		1			4		1					
Bangkok	C		1	1	3															
	D				1															
Spain (see also table below):																				
Malaga	D		1	1																
Seville	C				1															
Valencia	C	1			2					1		1	1							
Straits Settlements: Singapore	C		1			1	1				1					1				
Sudan (Anglo-Egyptian)	C				4	85	13	27	56	13	10	28	250	54	29	18		35	39	
	D				4	42	2	7	13	5	7	8	75	10	6	8		14	4	
Sudan (French) (see table below).																				
Switzerland	C				2															
Syria (see table below).																				
Tunisia: Tunis	C				4	3	2	4	2	6	1		1	2						
Union of South Africa:																				
Cape Province	C	P				P														
Natal	C					P	P			P	P	P	P							
Orange Free State	C		P	P	P	P							P							
Transvaal	C	P	7																	
Union of Soviet Socialist Republics (see table below).																				
Upper Volta	C						2	3				2			P					
Venezuela:																				
Maracaibo	D	1				1				1										
On vessel:																				
S. S. Arendskerk at Singapore, from Amoy, China	C												P							
S. S. Tjileboet at Hong Kong, from Shanghai	C																	P		
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C													1						

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927	December, 1927	January, 1928			February, 1928			March, 1928			April, 1928			May, 1928
								1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Algeria (see also table above)	C	376	459	382	682															
Oran	C	14	10	16	11															
Indo-China (French) (see also table above)	C	19	3	21	25	38	34		40	18	50	31	90	57	71	69		35		
Senegal (see also table above)	C																	51		
	D																	7		
Sudan (French)	C									4		5	1	P.	5			4		
Syria: Aleppo	C						1		1											
Beirut	C						2			15	11	26		12	7	4	3	5	1	2
	D															2	1			
Damascus	C		3	5	22	13	12	11	2						1					

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Angola	C	51	73	71	7	10	36	
	D		2					
Congo	C	5	77				36	
Cuanza-Norte	C	1						
Cuanza-Sul	C		2		7	10		
Loanda	C	1						
Zaire	C	3	4	1				
Brazil (see also table above): Porto Alegre	C	11	4	1			1	
British East Africa (see also table above): Zanzibar	C		2					
	D		1					
Chosen	C	21	2	2		4	21	
	D	6		1		2	8	
Ecuador: Guayaquil	C	4	1	1	4	2	9	24
	D							1
France	C	37	7	4	14	11	10	13
Gold Coast	C	7	4				1	3

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
Greece	C	10	4		5	6	11	19
	D						2	2
Latvia	C		2				1	
Mexico (see also table above)	D	221	132	157	157			
Morocco	C	180	81	140	401	55	47	30
Nigeria (see also table above)	C	820	223	93		275	217	
	D	173	51	30		39	45	
Persia	D			2		7		
Portugal (see also table above)	C					143	215	
	D					22	8	
Spain: Madrid	D			1				
U. S. S. R.: Railways, etc	C	26	7	11	15	18		
Other territories in Europe	C	366	220	471	565			
Transcaucasus, Siberia, and Central Asia	C	80	40	21	20			
Ukraine	C	27	11	20	17	6		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicat ; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Week ended— February, 1928		March, 1928					April, 1928				May, 1928	
									18	25	3	10	17	24	31	7	14	21	28	5	12
Algeria (see also table below):																					
Algeria	C							1			1	2	1	1	2	5	1	3			
	D										1							2			
Oran	C						4	2	2	1	6	1	1		2	1	1	6	2	2	
	D																	1			
Austria: Vienna	C							1													
Bulgaria (see also table below):																					
Sofia	C			17	6	1	6	1					3		3	14				1	1
	D				1																
Chile:																					
Antofagasta	D			1																	
Talcahuano	D		1											1							
Valparaiso	C		1		1	2	1				1										
	D	2	1		2																
China (see also table below):																					
Manchuria—																					
Dairen	C																7		3		
Harbin	C	2			1																
Tientsin	C		2																		
Chosen (see table below)																					
Czechoslovakia (see table below)																					
Egypt	C	2		12	4	14	8	9		13	3	1		1	1		2	1			
	D	3		5		8	4	2		5	3			1							
Cairo	C					3										2	3				
	D					3										1	3				
Port Said	C			1		1															
Behera Province	C															29	23				
Gharbieh Province	C															23	5				
Keneh Province	C															5	29				
Greece (see table below)																					
Ireland (Irish Free State) [1]	C							1									1				
Cork County	C					3	1														
Donegal County, Letterkenny	C			4																	
Japan (see table below)																					

Latvia (see table below)																					
Lithuania (see table below)																					
Mexico (see also table below):																					
Guadalajara	D					1															
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	15	5	1		4	3	6	6			4		2		
	D				2	1	5				3	1		3					1		
Monterey	D													1							
Morocco (see also table below)	C						342	1,051	141			175	172	-167	219	190	186	167	136	102	
Palestine	C	11	1	5	3	9	8	5	1	2	6	1	5			2	3		1	2	2
Peru (see table below)																					
Poland	C	50	35	19	64	93	195	346	57	62	57	89	90	90	125	77	93				
	D	6	2	4	11	10	16	19	10	3	7	6	5	6	7	7	8				
Portugal (see also table below): Oporto	C	1			1			1													
Rumania	C	36	16	17	22	35	68	39		14	26	28	29	34	33	45	36	38			
	D	1		2			3	9			4	1	2	2	3	4		6			
Syria (see also table below): Aleppo	C		2				2														
Tunisia	C	14		3	1	1	6	4	1				13		5			2	16	1	
Union of South Africa:																					
Cape Province	C	P	P	P	P	P	1	1	P	P				P	P	P	P				
Natal	C	P	P	P	P	2	3	1	P	P		2	P	P	P		P				
Orange Free State	C			P		P		P	P	P				P	P						
Transvaal	C	1		5	P	P								P	P						
Union of Soviet Socialist Republics (see table below)																					
Yugoslavia (see table below)																					
On vessel: S. S. Gaika at Durban, Natal—from Mauritius	C										1										

Place		1927				November, 1927			December, 1927			January, 1928			February, 1928		
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Algeria (see also table above)	C	67	33	10	12												
	D	13			1												
Algiers	C	2	2	6	2												
Bulgaria (see also table above)	C	12	24	7	2						2	7	6		8	12	6
	D		1	2	1						1		1		1	2	2
Morocco (see also table above)	C	148	76	7	11	5	14	7	5	6	75						

[1] 4 cases of typhus fever were reported in the Irish Free State June 4, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths, P, present]

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928	March, 1928
China (see also table above):								
Shanghai	D			1				
Chosen	C	90	16	26	38	183	400	
	D	8	1	2	3	19	44	
Chemulpo	C	3				1		1
Gensan	C	2				1		
	D					1		
Seoul	C	5	2					10
	D	1	1					1
Czechoslovakia	C	12	1		6			25
Greece: Athens	C	3			1	2	2	
Japan	C	1		1				
Latvia	C	6					1	26
Lithuania	C	69	9	18	27	86	137	
	D	14	1	1	1	10	12	
Mexico (see also table above)	D	64	36	29	33			
Peru:								
Arequipa	D	3	2		1	2		
La Oroya	C					P	P	P
Lima	C	8						
Turkey	C						17	
	D						1	
Union of Soviet Socialist Republics:								
Railways, etc	C	77	23	33	46	41		
Transcaucasus, Siberia, and Central Asia	C	208	61	49	80	7		
Ukraine	C	295	151	198	282	533		
Other territories in Europe	C	1,839	521		1,403			
Yugoslavia	C	20	1	1		7	24	3
	D	5				3		

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28	February, 1928: 4	11	18	25
Belgian Congo:																				
Boma	C											3								
	D											2								
Matadi	C											6	12	11	1	5	8			1
	D											2	6	8	2	5	6			

Brazil:																				
Estancia [4]																				
Rio de Janeiro [5]																				
Dahomey:																				
Grand Popo	C						1													
	D						1													
Porto Novo	C	1																		
	D	1																		
Gold Coast (see also table below):																				
Ashanti—																				
Obuasi	C		1																	
	D		1																	
Ivory Coast	C	1									1									
	D	1									1									
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	38														
	D	3	9	21	31	28														
Dakar	C	1			12	14	2	1	4			1	1							
	D				7	10	2	1	4			1	1							
Togoland	C		1																	
	D		1																	

Place		July	August	September	October	November	December	January	February	March	April	May
Gold Coast	C	15	2	6	1							(6)
	D	4	2	4	1							

[4] A case of yellow fever was reported near Estancia, State of Sergipe, Brazil, Mar 4, 1928.
[5] 2 deaths from yellow fever and 2 suspected cases were reported at Rio de Janeiro, Brazil, June 4, 1928. The disease was said to have been imported from the Pernambuco district.
[6] 1 case of yellow fever at Accra, Gold Coast, reported May 18, 1928; probably laboratory infection.

TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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SPECIAL ARTICLES

Study of the Dust Hazard in a Large Portland Cement Plant

Sewage-Polluted Surface Waters as a Source of Water Supply

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS are issued weekly by the United States Public Health Service through its Division of Sanitary Reports and Statistics, pursuant to acts of Congress approved February 15, 1893, and August 14, 1912

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CONTENTS

PUBLIC HEALTH REPORTS

VOL. 43 JUNE 15, 1928 NO. 24

THE HEALTH OF WORKERS IN DUSTY TRADES

The health hazards of dusty trades have for a long time engaged the attention of industrial hygienists. The great interest attached to this subject is due to two important facts: (1) The workmen employed in what are termed the "dusty trades" comprise the largest group of workers exposed to any one industrial hazard, and (2) exposure to certain kinds of dust has strikingly increased the mortality rate from respiratory diseases, especially tuberculosis.

While a great amount of work has been done in the study of the dust hazard in industry, there are certain questions that remain unanswered; and in the hope of contributing to a better understanding of the problem as a whole, the United States Public Health Service has undertaken special studies which are planned to cover the entire field of dusty trades. For this study the following six industries were chosen, in each of which the principal dust to which the employees were exposed represents a large group of dusts:

1. The cement industry, representing calcium dust.
2. Silver polish, representing metal dust.
3. The granite industry, representing silica dust.
4. The hard-coal industry, representing carbon dust.
5. The cotton industry, representing vegetable dust.
6. Street sweeping, representing municipal dust.

The first of these studies, dealing with the health of workers in a large Portland cement plant, has been completed and the report has recently been published as Public Health Bulletin No. 176. The investigation was conducted in one of the older, dustier plants, so that the effect of large quantities of the dust could be observed. Records of all absences from work were kept for three years, and the nature of disabling sickness was ascertained. Physical examinations were made, X-ray films were taken, and the character and amounts of dust in the atmosphere of the plant were determined.

The results of this investigation indicated that the calcium dusts generated in the process of manufacturing Portland cement do not predispose workers to tuberculosis nor to pneumonia. The workers exposed to dust experienced, however, an abnormal number of attacks of diseases of the upper respiratory tract, especially colds, acute

bronchitis, diseases of the pharynx and tonsils, and also influenza, or grippe. Attacks of these diseases serious enough to cause absence for two consecutive working days or longer occurred among the men in the dustier departments at a rate which was about 60 per cent above that for the men in the comparatively nondusty departments. Limestone dust appeared to be slightly more deleterious in this respect than cement dust.

Outdoor work in all kinds of weather, such as was experienced by the quarry workers, appeared to predispose to diseases of the upper respiratory tract even more than did exposure to the calcium dusts. In the outdoor departments of the plant, also, the highest attack rates of rheumatism were found. The study also indicated that work in a cement-dusty atmosphere may predispose to certain skin diseases such as boils, to conjunctivitis, and to deafness when cement dust in combination with ear wax forms plugs in the external ear. When the dust in the atmosphere is less than about 10,000,000 particles per cubic foot of air it is doubtful that the above-mentioned diseases and conditions would be found at greater than average frequency.

Modernization of plants and installation of ventilating systems are helping to solve the dust problem of the industry.

A limited number of free copies of the bulletin containing this report are available and may be had upon application to the Surgeon General, United States Public Health Service, Washington, D. C.

SEWAGE-POLLUTED SURFACE WATERS AS A SOURCE OF WATER SUPPLY [1]

By H. W STREETER, *Sanitary Engineer, United States Public Health Service*

One of the outstanding features of American waterworks practice is the extensive use made of surface bodies of water, and especially of streams, as a source of public water supplies. Although the actual number of public water supplies originating in underground sources is greater in this country than the number taken from surface sources, it is probable that surface sources provide at least two-thirds of the total volume of, and serve two-thirds of the population using, public water supplies.

This situation has been a natural outgrowth of the physical conditions prevailing in those sections of the United States, notably in the extensive inland areas of the Middle West and in certain portions of the Atlantic Seaboard States, in which the most intensive development of industrial cities has occurred. In these regions water readily available from underground sources is frequently insufficient in volume

[1] Read at the meeting of the American Society of Civil Engineers held at Asheville, N. C, Apr. 20, 1927, and published here by permission of the society.

and often excessively hard; hence recourse necessarily has been had to surface streams and lakes. Present indications, moreover, point to the likelihood that an increasing amount of dependence must be placed, in future years, on surface sources of water supply for public use, both in the regions named and in other sections of the country, owing to the steady diminution in the volume of underground water resulting from overdrafts made to supply increasing populations.

Coincidently with these developments has occurred a steady increase in the pollution of surface watercourses by sewage and industrial wastes, particularly in the areas above noted. This tendency has been due both to a disproportionate growth in urban population, as compared with that of rural population, and to the extension of water-carriage sewerage systems in the existing urban population groups. A good example of the rapidity with which the urban population of the Middle West has increased is furnished by population estimates for the Ohio River basin,[2] which have shown that, in the period of 25 years extending from 1890 to 1915, the urban population inhabiting this area increased 109 per cent, whereas the rural population increased but 16 per cent. It has been estimated that from 85 to 90 per cent of all domestic sewage in the Ohio River basin is discharged without any treatment into the nearest surface watercourse. The proportion of industrial wastes similarly discharged without treatment probably approaches very closely 100 per cent.

Until very recently the use of surface streams for the dual purpose of water supply and sewage disposal has been attended by comparatively few serious difficulties in obtaining reasonably safe water supplies from such sources. One contributory factor has been the ample length and relatively large volume of our major inland streams, affording an opportunity for dilution and self-purification to act as natural protective agencies. A second and more important element has been the remarkable advance made in the development and application of water purification in this country during the past three decades. In 1924 statistics collected by Gillespie[3] showed that over 23,000,000 people in the United States were being served by public water supplies purified by filtration processes.

During the past two decades or so, a steady reduction has taken place in the incidence of typhoid fever and other water-borne diseases throughout the country, notably in urban communities using purified surface water supplies. In spite of this tendency, pollution of the sources of many surface supplies has increased with such rapidity that questions have arisen as to the possibility of a failure of existing safeguards, both natural and artificial, to afford an adequate degree

[2] Public Health Bulletin No. 143, U S Public Health Service, Section III, Table No 34.

[3] Gillespie, C. G: Filtration Plant Census, 1924 Jour. Am. W W. Assoc, vol. 14, July, 1925, pp. 128-132.

of protection to such supplies. In other instances, where an ample margin of safety still exists, sanitary authorities are considering what measures may be necessary in order to forestall a situation such as has developed in the more populous areas of the country. The extent to which the availability of these sources may be affected by their progressively increased pollution is, therefore, a question of practical importance to all sanitary engineers and others who are concerned with maintaining the safety of public water supplies. It is proposed here to consider this question mainly in relation to the pollution of surface water supplies by domestic sewage, which, to a large extent, involves problems quite distinct from those resulting from their pollution by industrial wastes. It is intended, however, to mention very briefly at a later point one or two aspects of the latter which bear a particularly significant relation to the quality of water supplies in certain important industrial areas of the country.

In a broad sense, the suitability of sewage-polluted bodies of surface water as sources of water supply is dependent on a number of factors, including the following:

(*a*) The character and extent of their pollution;

(*b*) The location of the sources of pollution with respect to sources of water supply;

(*c*) The degree of protection to these sources afforded by various natural agencies, such as dilution and self-purification;

(*d*) The extent of further protection afforded by artificial water-purification; and

(*e*) The practicability and relative economy of supplementary artificial measures for reinforcing, where necessary, the protection afforded by water purification.

From a practical standpoint the most important of the five factors above named is the extent of protection afforded by artificial processes of water purification, which have become the main source of reliance in safeguarding the sanitary quality of surface water supplies in this country. Standing next in the order of relative importance is the practicability and economy of further artificial measures, both of water purification and of sewage treatment, for reinforcing the protection afforded by water purification as now currently practiced. Before discussing these two questions, however, it is proposed to consider rather briefly some of the agencies of pollution and of natural purification which influence more or less directly the relative suitability of sources of water supply located in surface bodies of water.

AGENCIES OF POLLUTION

Domestic sewage.—The most important agency of pollution affecting the quality of public water supplies derived from surface sources is, of course, domestic sewage, which contains large numbers of

intestinal bacteria originating in both human and domestic animal populations. A secondary, though sometimes highly significant agency of bacterial pollution consists of the surface drainage waters from unsewered areas, which usually contain some bacteria of intestinal origin. A third agency may be said to include, in general, certain kinds of industrial wastes, which, under some conditions, may cause unpalatable tastes in water supplies or may add measurably to the costs and difficulties involved in their efficient purification.

It has long been recognized that the numbers of intestinal bacteria contained in ordinary domestic sewage are extremely high. Thus, it commonly has been stated that the total bacterial count of sewage ranges from 1,000,000 to 10,000,000 per cubic centimeter, and that the *B. coli* content approximates 100,000 per cubic centimeter. Assuming a daily sewage flow equal to 120 gallons per capita, a fair average for the larger American cities, the *B. coli* figure given would indicate a contribution of this organism roughly approximating 200,000,000,000 per capita daily. Observations made by investigators of the United States Public Health Service in the Ohio and Illinois Rivers during the years 1914–1916 and 1921–22, respectively, indicated[4] that the average numbers of *B. coli* contributed to these streams by the metropolitan areas of Cincinnati, Louisville, Chicago, and Peoria, ranged from about 190,000,000,000 to 360,000,000,000 and averaged about 250,000,000,000 per capita daily. These figures, being derived from observations made in the stream above and below each city, represent the effect of combined sewage and surface drainage water from the areas considered. They are very considerably in excess of those which have been given as representing the normal bacterial content of human feces, which was found by MacNeal, Latzer, and Kerr[5] to be about 5,000,000,000 per capita daily, as expressed in terms of the numbers of bacteria growing on agar plates at 37° C. While making due allowance for the fact that combined sewage contains many sources of bacteria other than feces, the wide disparity of the figures above given suggests the possibility that bacteria of intestinal origin may increase in sewage for some time after its discharge into a sewerage system, or a stream, either by actual multiplication or by the progesssive disintegration of particles containing bacteria.

Industrial wastes.—In some of the industrial sections of the country, the pollution of streams and lakes by wastes from certain industries has been causing serious, and in some cases widespread, damage to

[4] (*a*) A study of the Pollution and Natural Purification of the Ohio River. Part II Results of Surveys and Laboratory Studies. Public Health Bulletin No 143, pp 251–256 (*b*) A Symposium on Stream Pollution Part IV. Quantitative Studies of Bacterial Pollution and Natural Purification in the Ohio and Illinois Rivers. By J. K. Hoskins. Trans Am. Soc C. E , vol. 89, pp 1365–1377, also Reprint No. 1063 from Public Health Reports, January 19, 1926, pp 319–331.

[5] MacNeal, W. J., Latzer, L. L., and Kerr, J. F.. The Fecal Bacteria of Healthy Men. Jour. Infect. Dis., 1909, vol. 6, Nos. 2 and 5

sources of public water supply. In general, such damage usually is æsthetic or economic rather than hygienic in its nature, though in some instances it may and does assume the aspect last named. A good example of æsthetic damage has been afforded during the past few years by the pollution of sources of water supply located in the Ohio River basin and along the Great Lakes by phenol-bearing wastes from by-product coke plants. The unpleasant tastes in water supplies caused by the presence of minute traces of phenols and their chlorine derivatives are so well known that it is hardly necessary to dwell on them here. Examples of economic damage by industrial wastes are provided by instances in which the presence of acids and acid wastes have increased the hardness of water supplies to such an extent as to render such supplies unfit for boiler use. Although accurate and up-to-date statistics on this point are not available, it is safe to say that pollution of this general character has added many thousands of dollars annually to the cost of producing steam power in certain areas of the Middle West, notably in the upper Ohio River basin

The hygienic aspects of industrial waste pollution of water supplies, though in many cases obscured to some extent by their indirectness, are in the aggregate far from being a negligible factor in the growing complexities of water-supply sanitation. In some instances the hygienic and economic features of the problem are inseparably bound together, as, for example, where the presence of certain kinds of industrial wastes, notably from tanneries and steel mills, in raw water supplies taken for purification, increases both the difficulty and the cost of securing efficient treatment In at least one case known to the writer the physical deterioration in municipal water filtration plants resulting from the presence of excessive amounts of acid wastes in their raw water supply has diminished very measurably their average bacterial efficiency, even with highly skilled operation. In other instances, particularly those involving the causation of disagreeable tastes, water consumers have been known to have sought unsafe private sources of drinking water in preference to using the safer but less palatable public supply.

MODIFYING INFLUENCES

The extent to which the several agencies of pollution above described may influence the quality of water supplies taken from polluted streams or lakes is modified by a number of factors, of which the following are the more important: (*a*) Seasonal changes, (*b*) dilution, and (*c*) natural purification. Although the three factors enumerated are interrelated to some extent, each one of them produces more or less characteristic and measurable effects.

In considering these effects, distinction should be made between conditions prevailing in flowing streams and those frequently observed in quiescent and semiquiescent bodies of water. In the former instance the dispersion of polluting matters within the stream, though often proceeding slowly in a lateral direction, is usually extremely rapid in a vertical plane and has a tendency in general to become stabilized after a fairly definite interval of flow. In the latter case, however, the admixture of polluting wastes, discharged along the shores of lakes and ponded streams, frequently is subject to the vagaries of winds and countercurrents to such an extent that uniform dispersion in the diluting body of water seldom is attained, even after relatively long intervals of time.

Seasonal influences.—Cyclic changes of season exert their influence in two general ways: (*a*) Through their effect on variations in the bacterial content of sewage as discharged at the outfall; and (*b*) through their influence on variations in the rate of natural purification. Studies by investigators of the United States Public Health Service in the Ohio, Illinois, and Upper Mississippi Rivers have given marked evidences[6] of a fairly orderly seasonal variation in the numbers of *B. coli* per capita contributed daily to these rivers by the larger centers of sewered population, the numbers reaching a maximum during the late summer and a minimum during the winter. In the Ohio River below Cincinnati the ratio of the summer average to the winter average numbers of *B. coli* was found to be equal to 4.9, and in the Illinois River below Chicago and Peoria, 10.5 and 11.4, respectively. Similar variations were observed[7] by the International Joint Commission in the St. Clair, Detroit, Niagara, and St Lawrence Rivers below major points of pollution.

As to the causes of the phenomenon above noted, they still remain a matter for speculation. A few experiments have been made to determine whether the numbers of intestinal bacteria voided by healthy persons are consistently greater in the summer than in the winter, but the results of these experiments thus far have been inconclusive. It is possible that, under the more favorable temperature conditions prevailing in summer, organisms of the *B. coli* group actually multiply in sewage during its passage through sewerage systems and even in streams immediately below sewer outfalls, whereas under the less favorable winter temperatures they fail to do so, at least to a like extent. Regardless of its underlying causes, the phenomenon noted has been observed so consistently as to remove it from the category of mere chance. Its significance would appear to lie in the indication that the density of bacterial pollution

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6 Public Health Bulletin No 143, pp 246-251 Public Health Bulletin No 171, pp 163-165

7 Pollution of Boundary Waters Report of Consulting Sanitary Engineer on Remedial Measures. March, 1916.

of sources of water supply located in highly polluted sections of streams, or in shoreward zones of lakes not distant from sewer outfalls, may be expected to be considerably higher during the summer months than during the winter season, all other conditions being equal. In general, this indication has been borne out by observation, subject to such modification as may be imposed by the effects of seasonal changes on the rate of natural purification, which will be discussed later under that heading.

In so far as industrial wastes are concerned, seasonal changes do not appear to exert any marked effect on their pollution density, except under conditions in which a particular industry is seasonal in its character. In some instances, notably in the pollution of water supply sources by phenol-bearing wastes, the winter season has been, in general, the far more critical; but as the gas and coke by-product industries producing such wastes are not seasonal in their activities, this condition hardly appears to be due to any seasonal variation in the amount or strength of the wastes from these industries.

Dilution.—In general, the modifying effects of dilution on the density of polluting matters discharged into natural bodies of water are fairly simple, except when complicated by secondary chemical or biological reactions following the process of dilution. If, for example, two streams (A) and (B), having, respectively, discharges equal to (Q_a) and (Q_b) and pollution densities (P_a) and (P_b) combine to form a third stream (C), the pollution density of (C) ordinarily would be:

$$\frac{P_aQ_a+P_bQ_b}{Q_a+Q_b}$$

except as modified by imperfect mixture of the two streams.

In some instances involving secondary reactions, as above noted, the changes associated with dilution are less simple Examples involving secondary chemical reactions frequently have been observed where certain types of industrial wastes, such as those of an acid character, are discharged into alkaline streams. Below the confluence of the Monongahela and Allegheny Rivers, in the Pittsburgh-Wheeling zone of the Ohio River, the admixture of the highly acid Monongahela with the less acid Allegheny produces a marked precipitation of iron salts, which are carried by the former in large quantities and are also discharged by steel mills in the Pittsburgh district. Although reactions of this kind may benefit a stream temporarily in some respects, they also may result in the formation of end-products which may interfere with the efficient operation of water purification plants.

When domestic sewage is discharged into a diluting body of water, there sometimes occurs initially a temporary increase in the bacterial content of the mixture. An increase of this kind was observed in

1914–16 in the Ohio River[8] immediately below Cincinnati, and, in 1921–22, in the Illinois River[9] immediately below the outlet of the Chicago Main Drainage Canal. In the instances cited, the bacterial content was observed to reach a fairly well-defined maximum at a point tending to move downstream during the winter but confined within a river zone extending about 25 miles below the source of pollution. It is not thus far definitely known as to whether the increase observed represents a true bacterial multiplication or whether it is the result of a progressive disintegration of "clumps" of suspended matter containing masses of bacterial cells. Possibly both processes are involved to some extent. Regardless of its underlying cause, this phenomenon suggests the possibility that sources of water supply located within river or lake zones lying in close proximity to sewer outfalls may be subject, under some conditions, to a disproportionately excessive bacterial pollution due to an increase such as above described.

Natural purification.—The fact that sewage-polluted bodies of water tend to become progressively self-purified through natural agencies is so well established that it hardly seems necessary here to dwell on it. Although the underlying causes of natural purification phenomena are little understood, the effects produced by them are well known and frequently observed. Of these effects, the most important one in relation to the use of polluted bodies of water as sources of water supply is the tendency toward a progressive decrease in the density of bacteria, especially those commonly associated with sewage, which occurs in all such bodies of water.

Quantitative studies of bacterial self-purification in flowing streams have indicated that, following the attainment of a maximum density below a major source of pollution, bacteria of the types included both in the ordinary plate count and in the *B. coli* group tend to diminish in numbers progressively along a fairly well defined time-function curve, which follows closely a logarithmic path in its earlier stages, but tends to become increasingly flatter than such a path after passing through its initial phase. The proportionate rate of bacterial decrease is further modified by the temperature and other changes associated with seasonal cycles, the rate being higher in summer than in winter.

In Figure 1 are shown two bacterial reduction curves derived from *B. coli* observations[10] made in the Ohio River below Cincinnati, one curve being based on summer and the other on winter conditions. In each instance the curve has its initial point at the maximum density of *B. coli* attained in the river immediately below Cincinnati. On comparing the two curves it will be noted that the percentage of

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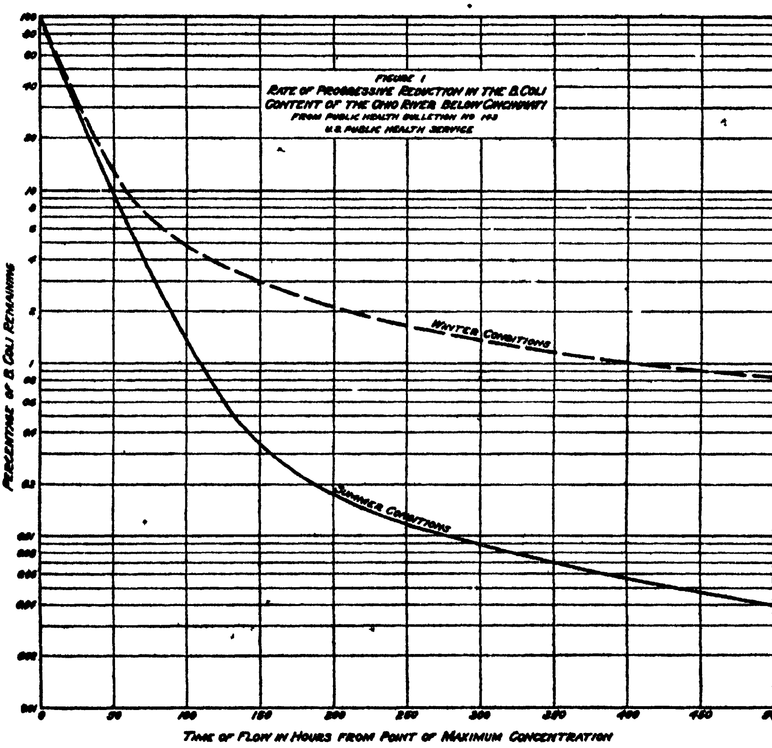
[8] Public Health Bulletin No. 143, U. S. Public Health Service, pp 276–277

[9] Public Health Bulletin No. 171, U. S. Public Health Service, pp 163–166

[10] Public Health Bulletin No. 143, U. S. Public Health Service. Tables 38 and 43.

initial *B. coli* density remaining after a mean time of flow equivalent to 100 hours is approximately 4.7 per cent under winter conditions and 1.5 per cent under summer conditions. For shorter times, the two residual percentages fall more closely together and for longer times diverge more widely from each other.

The relative effect at a given point in a stream of bacterial pollution originating from population groups located at more or less distant points upstream would be expected, on this basis, to be considerably greater under winter than summer conditions, all other things being equal. The converse may be true, however, of the



effect of pollution originating at more near-by sources, owing to lower stream flow and to the greater per capita contribution of sewage bacteria during the summer, both of which factors may offset the higher rate of natural purification in its earlier stages. The same general principle should hold with respect to the pollution of quiescent and semiquiescent bodies of water, when considered in reference to the times of passage of water between various sources of pollution and points at which water supplies are taken.

An illustration of the application of these principles is found in a calculation made of the relative effects of bacterial pollution derived from sewered population groups draining into the Ohio River and its

tributaries in successive 50-mile zones by water above the Cincinnati and Louisville intakes, respectively, during the summer and winter seasons of the year 1915.[11] In making this calculation the actual sewered population draining into each successive zone was tabulated, as shown in Table 1, together with the estimated mean time of flow of the river from the mid-point of each zone to the respective intake. By applying to each zone population a reduction factor represented by the percentage of *B. coli* remaining after the given time of flow, as shown in Figure 1, a series of "calculated equivalent" population figures was obtained representing, in each instance, the population which, if discharging sewage immediately above the intake, would have the same pollution effect at this point as did the actual corresponding population located in the particular upstream zone, under the seasonal and flow condition specified.

TABLE 1.[a]—*Actual sewered populations draining into the Ohio River and its tributaries in successive 50-mile zones, by water, above the Cincinnati and Louisville water intakes, respectively, together with their corresponding calculated equivalents with respect to the total bacterial pollution, in terms of B. coli, at each intake*

A. ABOVE CINCINNATI INTAKE

Zone	Actual sewered population		Estimated mean time of flow from center of zone to intake (Hours)		Calculated equivalent at intake			
					Winter		Summer	
Stream miles above Cincinnati intake	Number	Per cent of total	Winter	Summer	Population	Per cent of total	Population	Per cent of total
0-50	1,900	0.1	9	11	1,200	1.5	1,140	8.6
50-100	7,100	.3	27	34	1,920	2.4	1,570	11.8
100-150	32,300	1.4	45	59	4,520	5.5	2,360	17.7
150-200	244,700	10.2	63	88	21,300	26.0	5,680	42.5
200-250	41,300	1.7	82	116	2,480	3.0	326	2.5
250-300	63,200	2.7	100	145	2,970	3.6	234	1.8
300-350	32,200	1.4	118	174	1,260	1.5	74	.6
350-400	140,100	5.9	138	212	4,490	5.5	217	1.6
400-450	131,100	5.5	158	252	3,670	4.5	160	1.2
450-500	1,186,400	50.0	177	286	28,500	34.9	1,210	9.1
500-550	153,900	6.5	194	317	3,230	4.0	129	1.0
550-600	149,400	6.3	210	341	2,910	3.6	111	.8
600-650	80,000	3.4	225	365	1,440	1.8	51	.4
650-700	62,000	2.6	241	389	1,040	1.3	35	.3
700-750	38,100	1.6	256	413	598	.7	19	.1
750-800	9,000	4	272	437	135	.2	4	.0+
	2,372,700	100.0			81,663		13,300	

B. ABOVE LOUISVILLE INTAKE

Zone	Number	Per cent of total	Winter	Summer	Winter population	Winter per cent of total	Summer population	Summer per cent of total
0-50	800	0.03	10	24	472	0.4	276	1.9
50-100	200	.01	31	61	47	.04	14	.1
100-150	532,000	17.2	50	91	63,300	51.0	10,640	76.5
150-200	121,800	3.9	69	117	9,010	7.3	938	6.7
200-250	70,700	2.3	87	140	3,960	3.2	293	2.1
250-300	51,200	1.6	105	165	2,280	1.8	133	1.0
300-350	20,400	.7	123	194	765	.6	37	.3
350-400	245,500	7.9	141	223	7,800	6.3	358	2.6
400-450	72,100	2.3	159	252	1,930	1.5	86	.6
450-500	26,600	.9	178	281	638	.5	27	.2
500-550	138,400	4.5	197	319	2,920	2.4	115	.8
550-600	774,000	25.1	217	358	14,500	11.6	511	3.7
600-650	604,100	19.6	236	398	10,300	8.3	332	2.3
650-700	106,900	3.5	254	424	1,710	1.4	49	.4
700-750	162,200	5.3	269	448	2,430	2.0	66	.5
750-800	63,400	2.2	285	472	900	.7	21	.1
800-850	83,900	2.7	300	496	1,130	.9	26	.2
850-900	9,000	.3	316	520	117	.1	2	.01
	3,083,100	100.0			124,000	100.0	13,900	100.0

[a] Data transcribed from Public Health Bulletin No. 143, Tables Nos. 133, 134, 137, and 138.

[11] The data for this calculation have been derived from Public Health Bulletin No. 143, Tables Nos. 133, 134, 137, and 138, pp. 329-334.

A comparison of the percentages of the total actual population located in each zone with the corresponding percentages which their "calculated equivalents" are of their respective totals, provides an index of the relative effects which the various population groups

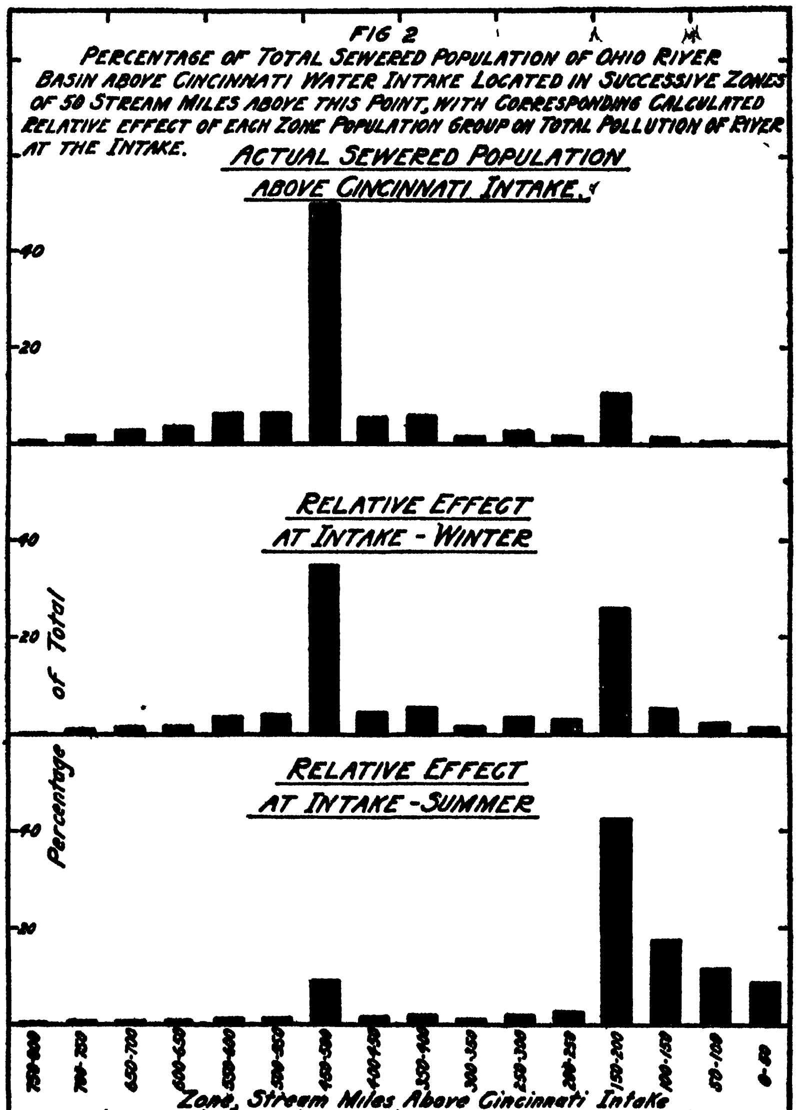


FIG 2
Percentage of Total Sewered Population of Ohio River Basin above Cincinnati Water Intake Located in Successive Zones of 50 Stream Miles above this Point, with Corresponding Calculated Relative Effect of each Zone Population Group on Total Pollution of River at the Intake.

were estimated as exerting on the pollution of the river at each one of the two intakes. The comparison is illustrated graphically in Figures 2 and 3, referring, respectively, to pollution conditions at the Cincinnati and Louisville intakes. In Figure 2, the effect of bacterial

pollution originating in the 50-mile zone located 450 to 500 miles above the Cincinnati intake, which includes the Pittsburgh metropolitan district, is indicated as being about 35 per cent of the total during the winter and only 9 per cent in the summer, when approxi-

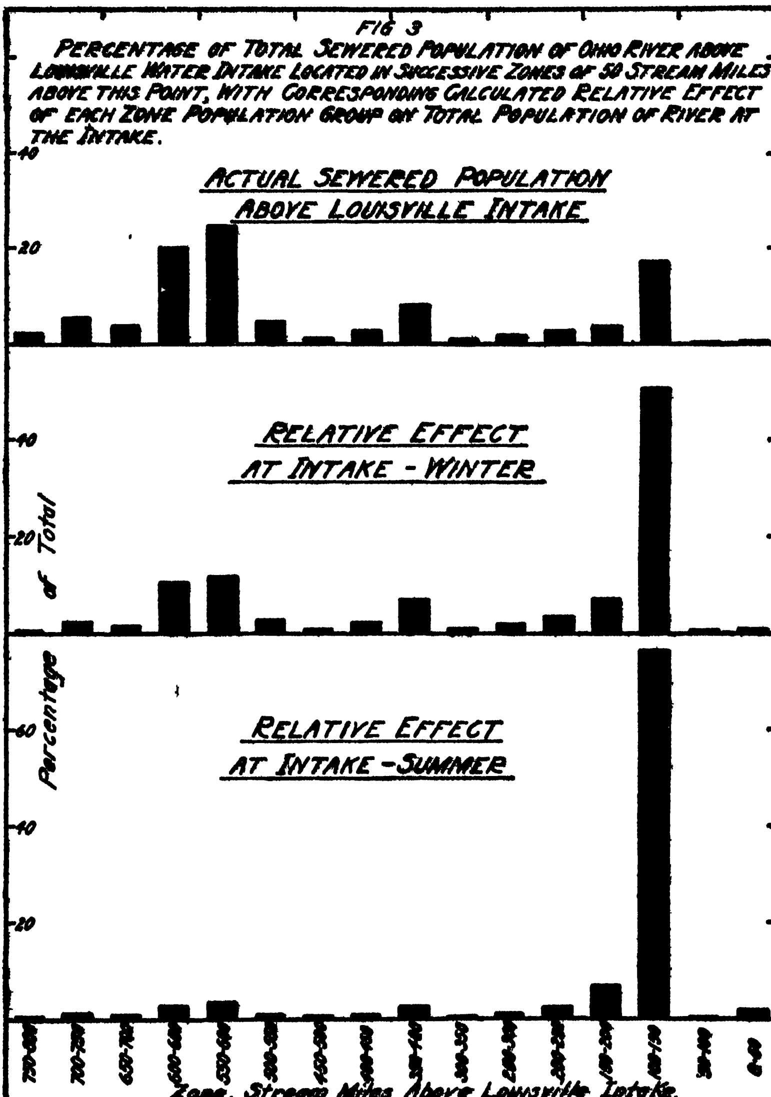


FIG 3
PERCENTAGE OF TOTAL SEWERED POPULATION OF OHIO RIVER ABOVE LOUISVILLE WATER INTAKE LOCATED IN SUCCESSIVE ZONES OF 50 STREAM MILES ABOVE THIS POINT, WITH CORRESPONDING CALCULATED RELATIVE EFFECT OF EACH ZONE POPULATION GROUP ON TOTAL POPULATION OF RIVER AT THE INTAKE.

mately 70 per cent of the total bacterial pollution at the intake is indicated as having been derived from zones lying within 200 miles above the intake. In Figure 3, sewage from the Cincinnati district and from Dayton, Hamilton, and other communities located in the

zone 100–150 miles above the Louisville intake is shown as being responsible for a large proportion of the pollution of the river at this point, both in winter and in summer. In this instance the relative effect of pollution derived from the Pittsburgh district (zones 550–600 and 600–650 miles) is small, even in the winter.

The illustrative examples above cited indicate, first, that in any appraisal of conditions of bacterial pollution surrounding a given source of water supply, full account should be taken not only of the relative sizes of the various population groups jointly responsible for the particular conditions at that source, but also of their respective locations, on a time-distance basis, with respect to the source in question. They further indicate that in any systematic stream-cleaning measures designed to protect sources of water supply, primary consideration should be given to sewage derived from population groups located in zones extending immediately above a given intake. Finally, they afford evidence that conditions of bacterial pollution occurring in streams during the winter season, when natural purification agencies are less active, may impose a more severe burden on sources of water supply than those prevailing during the summer season, as is shown by a comparison of the corresponding "equivalent population" figures given in Table No. 1. In this respect, the situation is quite the reverse of that which usually holds where the other aspects of stream pollution are concerned.

Having thus considered briefly some of the more significant elements involved in the bacterial pollution of surface sources of water supply and the extent to which it may be modified by natural agencies, it is proposed now to discuss the degree to which the effects of such pollution may be further offset by artificial methods.

EXTENT OF PROTECTION AFFORDED BY ARTIFICIAL PROCESSES OF WATER PURIFICATION

The extent of sanitary protection to water supplies of surface origin afforded by artificial processes of water purification may be said to depend primarily on the limitations of such processes with respect to their bacterial efficiency. Owing to the progressive advancement which has been and is occurring in the art of water purification, these limitations can hardly be regarded as being static; nevertheless they now appear to be sufficiently well defined to be capable of approximate determination for practical purposes.

In spite of the high degree of efficiency to which water purification has been developed, both in this country and in other countries, experience has shown that none of the processes involved in large-scale operations of this kind ordinarily are capable of removing from a bacterially polluted water all of the living organisms present in it. This is true not only of sedimentation and filtration processes,

aided or unaided by coagulation, but also, under normal conditions of practice, of those processes of chemical disinfection, such as chlorination, which have become such important adjuncts of modern filtration plants.

During the past few years a systematic effort has been made by the Public Health Service to determine, by combined observation and experiment, the nature and extent of the limitations above noted. These studies have had as their primary object the establishment of a basis for formulating, in specific physical and bacteriological terms, permissible limits of pollution of raw water supplies taken for purification from sewage-polluted sources of various classes, particularly in the inland navigable waters of the country on which large and important sections of the population are dependent for their public drinking-water supplies.

From these studies, which at the present writing still are in progress, a number of interesting conclusions of considerable practical significance have been drawn. Without entering into a detailed discussion of them here,[12] it is pertinent to note briefly the more significant conclusions thus far reached from them concerning the limitations surrounding the bacterial efficiency of water purification.

In general, the studies have shown that the efficiency of each separate process involved in water purification, such as, for example, coagulation, sedimentation, filtration, and chemical disinfection, is influenced by a number of factors, some of which are, and some are not, subject to physical control. Among the former may be noted the various conditions of plant design, such as retention periods provided in basins and depths and sizes of filtering material; likewise certain measures of operation, such as the amounts of coagulants and disinfectants used, the pH of the chemical reactions, and the rate of filtration. Among the latter are seasonal changes, notably those of temperature, and variations in the turbidity and bacterial content of the raw water.

More specifically, the studies have indicated that the average well-designed and well-operated rapid sand filtration plant, treating river waters such as are found in the Ohio and other river basins of the great Middle-Western plains, is capable of producing, with a fair degree of consistency, a final chlorinated effluent of acceptable palatability and conforming to the revised United States Treasury Department standard,[13] if the *B. coli* index of the raw water does not

[12] For such a discussion, see Public Health Reoprts March 31, 1922 (Reprint No 737), Jan 30, 1925 (Reprint No 987), Oct 1, 1926 (Reprint No 1114), July 15, 1927 (Reprint No 1170), also Public Health Bulletin No 172, U. S. Public Health Service

[13] The original Treasury Department standard, adopted in 1914 (Public Health Reports, vol 29, No 45, Nov 6, 1914, Reprint No 232) specified, in effect, that water served for drinking purposes by the interstate carriers should not contain numbers of *B coli* exceeding 2 per 100 cubic centimeters, as expressed in terms of the *B. coli* index The revised standard, adopted in 1925 (Public Health Reports, vol 40, No 15, Apr. 10, 1925, Reprint No. 1029) provides that the average *B. coli* index shall not exceed 1 per 100 cubic centimeters.

exceed approximately 5,000 per 100 cubic centimeters. A preliminary survey, now in progress, of a group of water-purification plants located along the Great Lakes has indicated thus far, however, that the average plant treating raw waters derived from these lakes can not produce consistently a final effluent of acceptable palatability and meeting the same standard of bacterial quality if the *B. coli* index of the raw water exceeds an amount falling somewhere below 2,000 per 100 cubic centimeters.

The extent to which modern water filtration plants treating surface waters from sewage-polluted sources are now dependent on continuous and effective chlorination of their effluents in order to produce drinking waters of acceptable bacterial quality is shown by the results obtained, in connection with these studies, from systematic observations of the quality of unchlorinated filter effluents as related to that of the various raw-water supplies. These observations have indicated, for example, that under the most favorable conditions thus far met in practice, the average water filtration plant treating river waters of the type above noted can not produce consistently an unchlorinated effluent conforming to the Treasury Department standard if the *B. coli* index of the raw water exceeds 60 to 100 per 100 cubic centimeters. In so far as plants treating Great Lakes waters are concerned, the corresponding average limit appears to fall somewhere less than 10 per 100 cubic centimeters.

Although the limits above stated are observational and, in the former instance, provide no working factor of safety, they may be regarded tentatively as representing the extreme limits of pollution of raw water supplies derived from the two respective types of sources named, which thus far have appeared to be most nearly consistent with the production, by the average plant, of effluents meeting a commonly accepted standard of bacterial quality under the particular conditions noted. These maxima may be said, therefore, to provide an approximate basis for judgment as to the suitability of sewage-polluted sources of water intended for purification to the respective degrees named.

It is especially worthy of note, in this connection, that for some reason or reasons not as yet fully determined, the bacterial efficiency of filtration plants treating raw waters such as are derived from the Great Lakes appears to be of a decidedly lower order of magnitude than that of similar plants treating river waters such as are found in the Ohio and other inland river basins lying east of the Mississippi.[14] If further observations now in progress should confirm this finding, it would appear logical to expect that any standard of bacterial pollution applicable to sources of purified water supplies located along the Great Lakes necessarily would be more rigid in its limiting require-

[14] No systematic observations thus far have been made west of the Mississippi River.

ments than would be a corresponding standard with respect to river waters of the Ohio type. In this connection reference should be made to the standard of raw water pollution set up by the International Joint Commission, in 1914, with respect to Great Lakes waters, the standard requiring, in effect, that the *B. coli* index of these waters, as delivered to purification plants for treatment, should not exceed 500 per 100 cubic centimeters.[15] Taking into account the factors of safety necessary to protect water purification plants treating waters of the Great Lakes from the effects of sudden and excessive variations in their bacterial content resulting from conditions somewhat peculiar to these waters in zones affected by shore pollution, the International Joint Commission standard would appear, from present indications, as being not far from that which ultimately may be found to be a reasonable one for such lake waters, though it probably is more rigid than is necessary for application to river waters of the Ohio River type.

SUPPLEMENTARY MEASURES FOR REINFORCING THE PROTECTION AFFORDED BY EXISTING WATER PURIFICATION SYSTEMS

The supplementary measures available for reinforcing the protection afforded by existing systems of water purification are of two general classes:

(1) Further elaboration of current water-purification processes; and

(2) Treatment of sewage and other wastes at their sources.

These measures are theoretically feasible to almost any desired degree. Practically, however, they are limited by a number of considerations, including those of economy. Let us consider, first, the further elaboration of current water-purification processes.

During the past three decades methods of water purification as practiced in the United States have undergone a steady course of improvement and of adaptation to the diversity of conditions existing in this country. In spite of their variations in respect to details, these methods have remained, however, substantially as they were at the time of Fuller's experiments at Louisville and Cincinnati in the late nineties. In New England and a few other limited areas of the country the English slow sand filter has proved satisfactory for the treatment of the relatively clear upland waters of these sections. Throughout the remainder of the country, including by far the greater portion, the rapid sand filtration process has been found best adapted to the purification of the variable and highly turbid river waters found in these extensive regions. The latter method, therefore, may be regarded as the more representative of current practice in the United States.

[15] Final report of the International Joint Commission on the Pollution of International Boundary Waters Reference 1918.

In its ordinary and more simple development the rapid sand filtration system provides facilities (*a*) for coagulating the raw water, (*b*) for subjecting it to a single stage of sedimentation after coagulation, (*c*) for passing it through rapid sand filters after sedimentation, and (*d*) for chlorinating it either before or after filtration.

Various elaborations of these ordinary water purification processes are being practiced, both in this country and abroad, with a considerable measure of success. Among the more important of these measures are—

(1) Long-time preliminary storage;

(2) Double-stage preliminary sedimentation, aided, in some instances, by two-stage coagulation;

(3) Double filtration;

(4) Prechlorination of the raw water, prior to its delivery to preliminary sedimentation basins.

In general, prolonged storage of sewage-polluted surface waters as a preliminary step in their more complete purification by filtration has not been adopted in the United States to the extent that it is practiced in Europe, notably in Great Britain. An important reason is the existence of unfavorable topography found along the relatively flat plains of many of our inland rivers and lakes, where the difficulties and cost of constructing storage reservoirs of large capacity are great. Although numerous stored water supplies are found in the mountainous sections of the Appalachian and Pacific coastal ranges, as a rule they are derived from relatively unpolluted upland sources and require little or no further treatment. Aside from a very few instances, notably at Albany, N. Y., double filtration, likewise, has had less use in this country than abroad, largely because of the added costs of treatment entailed by the added operating head required by this method.

Mainly for the reasons above noted, elaboration of the more simple types of filtration plants in the United States, when undertaken principally as a measure of offsetting increased raw water pollution, has had a tendency toward the extension of sedimentation devices and the intensification of chemical treatment. Along the Ohio River, for example, five municipal filtration plants now are equipped with double-stage sedimentation basins, aided, in three instances, by coagulation at both stages of treatment. At the new filtration plant located at Springfield, Ill., a mechanical clarifying device has been installed in advance of sedimentation. At three filtration plants located along the Great Lakes and at a few river plants treating highly polluted waters, prechlorination of the raw water prior to its treatment by coagulation, sedimentation, and filtration is being tested. Mention also should be made of the intensification of lime treatment

(commonly termed the "excess-lime" method) which is being practiced at a number of large water-softening plants and at a few plants devoted more strictly to water purification without softening.

In so far as can be judged from observational and experimental data now at hand, the elaboration of water filtration plants along the two lines last indicated above has resulted in extending very decidedly the permissible limits of raw water pollution, consistent with the production of effluents having a satisfactory bacterial quality, though in some instances, at the expense of their palatability, where the chemical treatment is too greatly intensified. Observations made at the five Ohio River plants, using double-stage preliminary sedimentation, have indicated that, as an average, they are capable of producing final chlorinated effluents conforming to the Treasury Department *B. coli* standard from raw river water having a *B. coli* index ranging as high as about 50,000 per 100 cubic centimeters. Although data concerning the corresponding efficiency of raw water prechlorination are too meager at present to warrant drawing any definite conclusions from them, they appear to indicate that this measure, when added to complete sedimentation and filtration treatment, can be made to yield a final effluent of satisfactory bacterial quality from raw river water having a *B. coli* index ranging as high as 10,000 or even 20,000 per 100 cubic centimeters.

The cost of these various added measures of water treatment is a factor, however, to which an increasing amount of attention probably will be given as sources of surface water supply become more highly polluted and recourse necessarily is had to such measures. In a recent paper,[16] Hansen states that the ordinary water purification system will cost up to $4 or $4.50 per capita, and the most highly elaborated plant up to $10 per capita. He gives the annual cost of purification as being usually less than 85 cents per capita.

In this connection, some interesting data bearing on the relation between the cost of water purification and the average density of raw water pollution have been obtained from surveys of a group of municipal water purification plants made during the past few years by investigators of the Public Health Service. In Table 2 is given a tabulation of the costs of operation of 10 municipal water filtration plants from which fairly complete data in this respect were secured. In order to reduce the costs to a comparable basis, they have been calculated to terms of the cost per million gallons of water treated and of the annual cost per capita.

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[16] Hansen, Paul: Trend of Practice in Water Purification. Canadian Engineer, vol 52, No. 10, pp. 95–97 (Mar. 8, 1927).

TABLE 2.—*Costs of water purification at 10 municipal rapid sand filtration plants, with average B. coli index of raw water as delivered to each plant*

[Data covering one year during years 1923-24]

Plant	Population supplied (estimated)	Average volume of water treated		Cost of treatment				Average B. coli index of raw water per 100 c. c.
		Million gallons daily	Gallons per capita, daily	Per million gallons		Per capita annually		
				Total	Chemicals	Total	Chemicals	
E. Liverpool, Ohio [1]	23,000	3.470	151	$11.63	$4.87	$0.62	$0.26	8,050
Steubenville, Ohio	32,000	4.695	144	9.38	3.68	.40	.20	4,780
Ashland, Ky	20,000	1.400	70	15.20	6.22	.70	.29	11,500
Ironton, Ohio	15,000	1 930	129	18.50	7.07	.87	.33	14,900
Portsmouth, Ohio [1]	42,200	6.190	147	8.41	3.55	.45	.19	4,930
Cincinnati, Ohio	400,000	49.560	123	6.76	2.44	.31	.11	2,980
Louisville, Ky	250,000	35.951	144	3.88	2.19	.20	.11	2,220
Henderson, Ky	13,000	2 158	55	(2)	3.28	1.32	.20	1,740
Elmira, N. Y	50,000	4.491	90	(3)	2.53	.47	.08	580
Niagara Falls, N. Y.	58,500	11.040	189	10.90	[4] 1.38	.75	.09	8,290
Means			124	12.22	3.72	.62	.19	5,000

[1] Average for three years, 1924, 1925, 1926.
[2] Affected by abnormal conditions, therefore omitted.
[3] Included pumping costs which could not be separated, therefore omitted.
[4] Raw water relatively clear, comparatively small amounts of coagulants used. Omitted from plot in Fig. 6.

In Figure 4, plotted from the data contained in Table 2, is shown graphically the relation observed between the annual average density of raw water pollution expressed in terms of the *B. coli* index, and the cost of chemical treatment per million gallons of water treated. It will be noted that, for a given degree of raw water pollution, this cost is slightly less at plants equipped with double-stage sedimentation than at plants having only single-stage sedimentation. Against this advantage, however, should be balanced the added cost, in the former instance, of constructing and operating the extra basins necessary to provide the two separate stages of sedimentation.

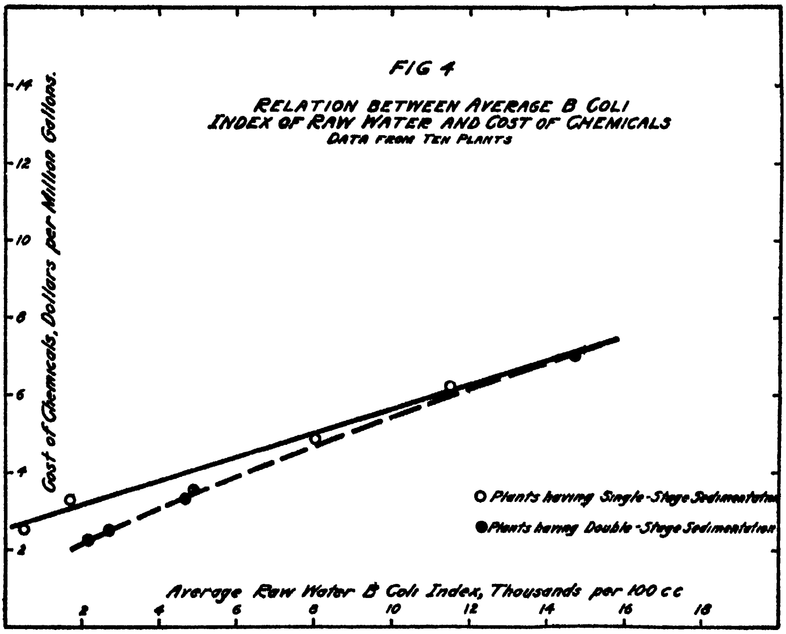
In Figure 5, also derived from Table 2, is shown the corresponding relation observed between the density of raw water pollution and the total cost of operation, which is indicated as ranging from about $5 to $20 per million gallons coincidently with a raw water *B. coli* index varying, as an extreme range, from 1,000 to 16,000 per 100 cubic centimeters. The graphs shown in Figures 4 and 5 indicate that for each successive increase of 1,000 in the average raw water *B. coli* index the total cost of purification is increased by approximately $1 per million gallons, and the cost of chemical treatment by about 30 cents per million gallons. These figures do not include the cost of pumping or any fixed charges against construction. From the figures given by Hansen, the latter would be expected, at 6 per cent, to range from 24 to 60 cents per capita annually, or from about $6 to $16 per million gallons of water treated, depending on the extent of elaboration of the plant.

By combining the fixed and operating costs above given, it may be estimated very roughly that the total cost of water purification, including construction and operation, may vary, in round numbers, from about \$10 to \$35 per million gallons, or from about \$0.40 to \$1.40 per capita per year, according to the degree of pollution of the raw water and the extent of plant elaboration required. Although the upper limiting figure of this range represents a degree of raw water pollution thus far encountered by relatively few water purification plants in this country, the difference between the two limiting figures, amounting to \$1 per capita annually, is significant as indicating the extent by which an extreme condition of this kind, where prevalent, may increase the total cost of water purification over and

FIG 4

RELATION BETWEEN AVERAGE B COLI INDEX OF RAW WATER AND COST OF CHEMICALS

DATA FROM TEN PLANTS



above that which is required for treating a moderately polluted water. It may be said, in fact, to represent approximately the added tax which an excessive pollution of sources of raw water supply, if allowed to become increased to an extent such as now prevails in portions of our more highly polluted river systems, may be expected to impose on the consumers of purified water supplies derived from such sources.

Sewage treatment measures.—The use of sewage treatment as a specific measure for protecting sources of water supply has been regarded, with justification, as being necessarily secondary to that of water purification, for reasons which are well known to all students of the problem as it has developed in this country. With the increasing pollution of our large river systems and the possible over-

burdening of some of the more highly elaborated water purification plants, more consideration may be expected to be given to this measure than heretofore has been necessary.

In this connection, a number of questions arise, among which two are of primary importance: First, What general method of sewage treatment may be regarded as affording adequate protection to sources of water supply? Second, What is the relative cost of such treatment, in comparison with the cost of other measures which may be utilized for relieving the overburdening of existing water-purification plants?

As regards the first of these two questions, opinions appear to differ. In England, where the streams are short and small in volume,

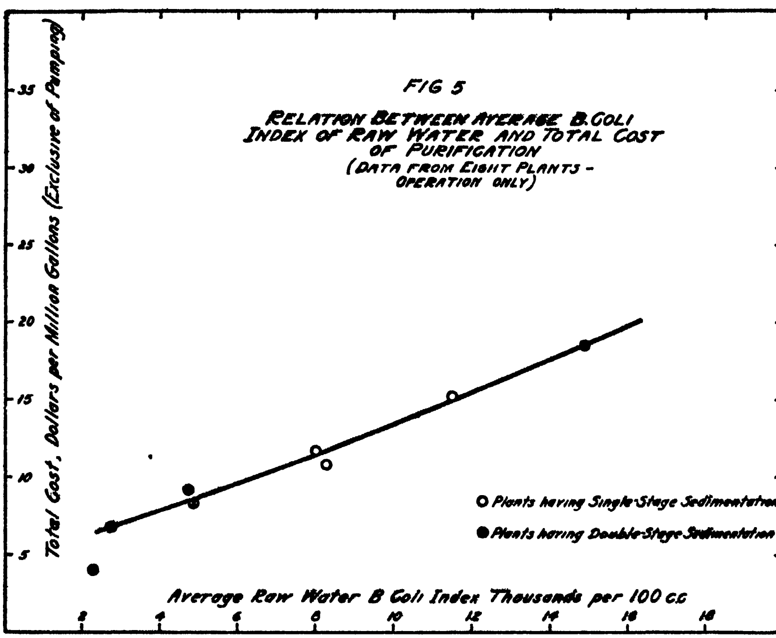


FIG 5

RELATION BETWEEN AVERAGE B. COLI INDEX OF RAW WATER AND TOTAL COST OF PURIFICATION (DATA FROM EIGHT PLANTS - OPERATION ONLY)

the view seems to prevail that nothing short of complete treatment of sewage, including its clarification, oxidation, and bacterial disinfection, may be considered as adequate for water-supply protection. In this country, partial clarification and disinfection have been advocated as being ordinarily sufficient, on the assumption that the treatment of sewage to this extent will render it bacterially innocuous and that more extensive purification is required only where the natural oxidation capacity of a stream is overtaxed. Superficially, the latter procedure would seem to be a reasonable one under most of the conditions prevailing in the United States, where the rivers are relatively long, are large in volume and, in a number of cases, possess an ample capacity for natural oxidation of sewage matters. On the other hand, it must be admitted that comparatively little

scientific information exists in this country as to the efficacy of partial sewage treatment when practiced solely as a measure for water-supply protection.

As regards the cost of complete sewage treatment, Hansen [17] has stated recently that the annual cost would average approximately 95 cents per capita, exclusive of the cost of necessary intercepting sewers, which would range from $1 to $10 per capita per year. From cost statistics [18] from a group of representative American sewage treatment plants, as given by Wagenhals, Theriault, and Hommon, it has been estimated that if the costs as given were corrected to a basis of the year 1924, the average total annual cost of treatment, including fixed and operation charges, would be about 90 cents per capita, which figure corresponds closely to that given by Hansen. (See Table 3.) With the cost of intercepting sewers excluded, the balance of cost as between complete sewage treatment and water purification would appear to be about equal where the more highly elaborated types of the latter are concerned, but to favor the latter in its more simple forms as ordinarily practiced. With intercepting sewers included, the balance clearly favors water purification, regardless of its degree of elaboration. Where highly elaborated water purification plants are overburdened, and the only remaining alternatives are sewage treatment or preliminary storage of the raw water at the intake, the relative costs of these two measures will be the determining factor.

TABLE 3.—*Per capita costs of sewage treatment, both as of date and corrected to the year 1924, as indicated by data from 11 representative sewage-treatment plants in the United States*

[Compiled from data given in Public Health Bulletin No. 132, U. S. Public Health Service]

Plant	Year constructed	Cost per capita							Factors	
		Construction				Operation (annual)		Total as of 1924 (4)+(6)	Construction [a]	Operation [b]
		Initial		Annual, at 6 per cent		1919–1920	As of 1924			
		As of date (1)	As of 1924 (2)	As of date (3)	As of 1924 (4)	(5)	(6)	(7)		
Alliance, Ohio	1913	$8 46	$19.45	$0 51	$1.17	$0 26	$0.30	$1.47	2 30	1.15
Atlanta, Ga	1913	3.78	8 69	.23	.52	.08	.09	.61	2.30	1.15
Baltimore, Md	1911	5 25	12.70	.32	.76	.13	.15	.91	2.42	1.15
Canton, Ohio	1916	5 27	8.80	.32	.53	.18	.21	.74	1.67	1.15
Columbus, Ohio	1908	3.37	8 63	.20	.52	.58	.67	1.10	2 56	1.15
Fitchburg, Mass	1915	8.55	18.90	.51	1.13	.30	.34	1.47	2.21	1.15
Houston, Tex	1916	3.73	6 23	.22	.37	.44	.51	.88	1.67	1.15
Lexington, Ky	1918	5.22	5.17	.31	.31	.16	.18	.49	.99	1.15
Reading, Pa	1907	3.74	9.16	.23	.55	.26	.30	.85	2 45	1.15
Rochester, N. Y. [c]	1915	4.12	9.11	.25	.55	.13	.15	.70	2.21	1.15
San Marcos, Tex	1916	1.60	2.67	.10	.16	.43	.49	.65	1.67	1.15
Total		53.09	109.51	3.20	6.57	2.95	3.39	9.96	22.47	
Mean		4.83	9.06	.29	.60	.27	.31	.91	2.04	

[a] Obtained from factors given in Table 33, "Water Works Practice," Am. W. W. Assoc., 1925, p. 490.
[b] Estimated from factors given in Table 38, "Water Works Practice," Am. W. W. Assoc., 1925, p. 495.
[c] Irondequoit plant.

[17] Canadian Engineer, vol. 52, No. 10, pp. 95–97. Mar. 8, 1927.

[18] Wagenhals, H. H., Theriault, E. J., and Hommon, H. B.: Sewage Treatment in the United States. Public Health Bulletin No. 132, U. S. Public Health Service.

In the foregoing estimates, a relatively complete degree of sewage treatment has been assumed. If such treatment were restricted to fine screening, or plain sedimentation, and chlorination, such as is commonly practiced for the protection of bathing beaches, the cost of sewage treatment would be correspondingly lowered. Thus, the cost of fine screening and chlorination combined may be estimated very roughly as being about $10 per million gallons of sewage treated or about 40 cents per capita annually. If this figure were used as the basis of comparison, the cost of such partial sewage treatment would appear to be practically the same as that of the more simple types of water purification. If the added cost of intercepting sewers were included, the balance again would favor water purification as being the more economical.

In estimating the extent of sewage treatment required in order to effect a specified degree of reduction in the average bacterial pollution of a stream at a given source of water supply, an analysis of the problem along lines such as are indicated in Table 1 and Figures 2 and 3 may be helpful. Let it be assumed, for example, that it were desired to reduce the average bacterial pollution of the Ohio River at the Louisville water intake by sewage treatment applied to population groups located in zones above that point. On referring to Table 1 it will be noted that the relative influence on the *B. coli* content of the river at Louisville exerted by sewered population groups located in the zones lying within 200 stream miles above that point was 58.7 per cent of the total under winter conditions and 85.2 per cent of the total under summer conditions such as prevailed in the year 1915, as is indicated by the percentages of the total "calculated equivalent" population effective at this point. If all of the sewage of this population, aggregating 654,800, were given treatment such as to cause a 90 per cent reduction in its *B. coli* content, the average density of *B. coli* at the Louisville intake, attributable to domestic sewage discharged into the river above that point, would be expected, on this basis, to be diminished by 0.90×58.7 per cent, or 53 per cent, under winter conditions, and by 0.90×85.2 per cent, or 77 per cent, under summer conditions. Under the more unfavorable winter condition, therefore, a reduction approximating one-half the total sewage pollution of the river at the Louisville intake, as expressed in terms of *B. coli*, would be expected to result from effective sewage treatment applied within the restricted zone specified. In this connection it is also significant to note that, on the basis of the percentages given in Table 1, equally effective treatment of all the sewage discharged into the Ohio River by the 1,378,100 of sewered population located in the two zones, 550–600 miles and 600–650 miles, in which the Pittsburgh district is included,

would be expected to reduce the average *B. coli* content of the river at Louisville by less than 20 per cent under the winter conditions of 1915 and by less than 6 per cent under summer conditions.

The foregoing illustration, though it should not be interpreted too literally as regards the actual figures obtained from the calculation, is instructive in showing that systematic stream-cleaning measures, if undertaken primarily for the protection of water supplies, may be applied with a considerable degree of economy if a thorough study is made of the comparative influence of wastes derived from various population groups, when considered in their time-distance relationships to the sources of such supplies. It is further significant as indicating a fairly simple method, in specific cases, for balancing the total cost of stream-cleaning measures against that of additional water purification, where practicable. In the instance above cited, for example, the cost of sewage treatment as applied to a sewered population aggregating 654,800 would be balanced against the cost of added water purification as applied to the population of Louisville, which in 1915 was estimated as being about 308,000. In this case, the balance clearly would favor added measures of water purification up to a point such that their per capita cost would be slightly more than double that of sewage treatment.

CONCLUSION

In concluding this paper it may be well to note very briefly the present status, in this country, of the general problem with which it has been concerned.

The excessive sewage pollution of surface bodies of water used as sources of water supply has begun to attain serious proportions in certain areas of the eastern and middle-western States, notably in the Ohio and Hudson River basins, and in some marginal zones of the Great Lakes, particularly at a few points located along Lake Erie, in the extreme southern end of Lake Michigan, and in some of the connecting waters as in the Detroit and Niagara Rivers. In portions of these areas water purification plants have been and are being elaborated more and more in an effort to offset increased raw water pollution. In some instances, recourse either to additional water storage or to sewage treatment measures probably will be necessary in the not distant future. In certain cases the presence of industrial wastes in sources of raw water supply is a further complicating factor, especially in the upper portions of the Ohio River and at some points along the Great Lakes.

Although isolated instances of excessive pollution, such as above mentioned, are found in other sections of the country, the situation in these areas is, in general, such that existing water purification

systems, where properly designed and efficiently operated, are not overburdened. In these regions systematic measures for preventing any widespread overloading of water purification plants can readily be taken and, in some cases, notably in North Carolina, are being actively considered by the State health authorities.

The effectiveness of measures for relieving or preventing the excessive pollution of water-supply sources will involve, however, not only a thorough knowledge of the technical phases of the problem, some of which have been discussed in this paper, but also the provision of an adequate and well coordinated administrative machinery, backed, where necessary, by intelligent legislation. Thus far, efforts to set up such a machinery have been hampered, to some extent, by a lack of the necessary technical groundwork, and further by the fact that the problem, in many cases, transcends State and even international boundaries. Studies such as are being made by the Public Health Service and other agencies are being aimed to evaluate the more essential technical factors involved in the problem. On the administrative side, an interesting experiment is being made by the States bordering the Ohio River in forming an interstate association with a view to coordinating the legislative and regulatory policies of these several States in dealing with stream pollution matters. In another case, an effort is being made to solve this question by interstate treaty. Within some States, sanitary districts are being organized for the purpose of effecting a well-coordinated joint solution of existing problems of water supply and sewage disposal.

The several activities thus noted, together with others of a similar nature, appear to give promise that a wise solution of these problems ultimately will be found. Further technical studies are needed, especially those concerned with the economic phases of the question, which are becoming increasingly important. There also remains the difficult problem of dealing with the excessive pollution of water supplies by industrial wastes, with its baffling technical and administrative aspects. In spite of these and numerous other unanswered questions, these matters can be faced with the renewed assurance bestowed by an awakened public interest in the conservation of our water resources and by the support which efforts to meet the problem are receiving both from the public at large and from various professional organizations. These resources are indeed our greatest national asset, indispensable both to our industrial development and to the continued health and happiness of our population. If unduly neglected, they may well become our greatest liability.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Enforcement of laundry ordinance not enjoined.—(Illinois Supreme Court; Ruban et al. *v.* City of Chicago et al., 161 N. E. 133; decided April 21, 1928.) Suit was brought by the plaintiffs to restrain the city of Chicago from enforcing an ordinance regulating the laundry business. The plaintiffs received soiled clothes and linens, had the same collected, washed, dried, and returned by steam laundry companies, and then hand-ironed the articles themselves. The city ordinance provided that any place, etc., which was used for the purpose of washing, drying, starching, or ironing wearing apparel, linens, etc., for the general public should be deemed a laundry, and required a license to conduct the same. The court held that the city had the power to direct the location and regulate the use and construction of laundries, and that the requirement of a license was legal. The plaintiffs contended that they were not engaged in the laundry business, the basis of their contention being that a laundry was a place where clothing and other articles were washed and ironed. But the court pointed out that the definition in the ordinance of a laundry, which definition it was held was a proper incident to the power conferred to regulate laundries, was that it was any place, etc., used for the purpose of marking, sorting, washing, drying, starching, or ironing the articles therein mentioned, and decided that the plaintiffs were engaged in the laundry business and were not entitled to the relief asked.

Recovery of damages for injuries from glass in milk denied.—(Massachusetts Supreme Judicial Court; Carlson *v.* Turner Centre System, 161 N. E. 245; decided April 5, 1928.) The plaintiff, who purchased a bottle of milk from a retail dealer, sought damages, for injuries from a small piece of glass in the milk, from the defendant corporation, which bottled and sold the milk to the retailer, in an action of contract on the ground of an implied warranty by the defendant that the milk was wholesome and fit for human consumption, but the supreme court denied recovery because there was no contractual relation between the defendant and the plaintiff, who had dealt only with the retailer.

Property owner personally liable for installation of sanitary toilet by city.—(Alabama Supreme Court; Town of Leeds *v.* Cason, 116 So. 519; decided April 14, 1928.) In an action by a municipality to recover the cost of installing a sanitary toilet on private property, upon failure of the owner to install same, as provided by an ordinance adopted pursuant to law, the court held that, although the city had failed to comply with the statutory provisions necessary to the enforcement of a lien on the property, there was a personal liability on the owner for the expense and that a contract action could be maintained.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Some of the Newer Industrial Hazards. Frederick B. Flinn. *The Boston Medical and Surgical Journal*, vol. 197, No. 28 January 12, 1928, pp. 1309–1314. (Abstract by R. R. Sayers.)

While toxicology is only one of the fields of preventive medicine, it is being considered of increasing importance as it is realized that perhaps exposure to industrial poisons may explain some of the obscure symptoms of which patients complain, but for which there is no apparent cause. It is known that many of the toxic substances are rendered harmless if the amount present in the air or dust can be kept below a certain maximum point. This can be done by proper methods of ventilation adapted to each particular hazard. It is the province of the medical man to determine the limits that can be tolerated by the human system, and that of the ventilating engineer to determine the methods of remedying the conditions.

Results are given of a study made by investigators of the United States Public Health Service among granite workers to determine whether or not a standard of dustiness could be set up as a maximum which might safely be considered as the limit for that industry. From the results of this study the conclusion is drawn that a certain amount of this dust is tolerated by the human system.

Lead is discussed as still being the most important industrial poison, with the exception of carbon monoxide. An analysis of 18 industries in which the most of the lead cases appear, shows that the precise cause of the incidence in all of them is the inhalation of either dust or fumes. If the dust and fumes should be completely eliminated, lead poisoning in the industries will be stopped. The statement is made that the suspicion seems justified at the present moment that a change in the hydrogen ion of a cell affects its affinity for lead, and the author is not willing to place all the blame for cases of lead poisoning among persons addicted to alcohol or lack of personal cleanliness. The symptoms and pathological effects of lead poisoning are pointed out.

The danger of the use of benzol in quick-drying paints is pointed out but; on account of the hazard, benzol is being replaced by such substances as xylol. Acute cases of poisoning from benzol occur most frequently in industry either when the benzol is being prepared from coal tar or is used in concentrated form, as in the blending of motor oils or in the extraction of certain chemicals, where the very nature of the process requires that the operation be carried on in a closed system for economical if for no other reasons. The symptoms and pathological effects of benzol poisoning are described.

Attention is called to deaths occurring among workers employed in painting dials with luminous material. The symptoms of poisoning from this source and the pathological effects are described. Two main exposures in the industrial production and use of radium are described: (1) Exposure to the emanation which may result in radioactive deposits in the body or in external burns when the material is handled in a careless manner; and (2) the ingestion of the radioactive material, either by inhalation of the dust or by actually swallowing the material through ignorance or willfulness on the part of the employees.

Deaths from Lead Poisoning. Frederick L. Hoffman. Bulletin No. 426, United States Bureau of Labor Statistics, Washington, February, 1927. (Abstract by Leonard Greenburg.)

Lead continues to occupy a position of supreme importance as an industrial poison, and for this reason the present bulletin is of much interest and value. In this volume Doctor Hoffman has analyzed the available statistics of chronic lead poisoning in the United States, Canada, Great Britain, and certain other foreign countries. In addition to this, there is presented an analysis of deaths from

chronic lead poisoning in the United States registration area from 1914 to 1924. The death certificates for lead poisoning are further classified by occupation and age, and in certain cases statistics concerning contributory causes of death are presented and analyzed. Lastly, in part 3 of the bulletin, are presented the statistics for chronic lead poisoning from four State accident boards, namely, Massachusetts, Pennsylvania, California, and New York.

It is obviously quite impossible in a brief abstract to present Doctor Hoffman's findings in any detail. The death statistics of the United States registration area as well as those of the Metropolitan Life Insurance Co. show that the death rate has been declining since the year 1912, and now, according to these data, has reached the rate of 1.6 per 1,000,000 persons exposed. The rate for white males and for colored males appears to be very nearly the same.

The largest number of deaths took place in the occupational group of painters, and but 62 deaths occurred in the group of lead workers in smelting plants, etc.

The worker in the field of industrial hygiene can not fail to be interested in this report, and to those interested in the problem of lead poisoning it is of great value.

The Use of Ozone in the Ventilation of the Automobile Service Station. M. R. Mayers. Indust. Hyg. Bull. New York, 1927, v. 3, 37–38. (Abstract by P. S. Lelean in *Bulletin of Hygiene*, vol. 2, No. 12, December, 1927, p. 971.)

"The author gives the analysis of motor-car exhaust air as: Carbon dioxide, 8.6 per cent; carbon monoxide, 6.3 per cent; oxygen, 2.3 per cent; methane, 0.9 per cent; hydrogen, 3.0 per cent; nitrogen, 78.6 per cent.

"The carbon monoxide increases to 11 per cent in the exhaust-air of cars under test in garages in hot weather.

"Hence 54 per cent of garage air tested had over the 0.1 per cent of CO which is regarded as the danger limit in the United States, while 69 per cent of garage men had CO in their blood in amounts ranging from 2.3 to 40 per cent of saturation point, in association with reduction of oxygen from the normal of 19 vol. per cent to as low as 2.4.

"Dizziness, smarting of the eyes, nausea, drowsiness, and incoordination caused complaints and inefficiency; but the most marked effect, and the predominant cause of stopping work, was intense headache.

"As an antidote, firms have marketed 'ozonators' under the erroneous idea that the ozone will oxidize the carbon monoxide to dioxide. The garage men have, however, found so much reduction of headache to follow use of these "ozonators' that the cause is being investigated. It is provisionally attributed to (*a*) psychological effect, and (*b*) action of ozone in preventing the carbon monoxide from markedly reducing the partial pressure of oxygen in the alveolar air."

Municipal Developments at Noranda, Quebec. Alex. M. Hogg. *Canadian Engineer*, vol. 54, No. 3, January 17, 1928, pp. 135–137. (Abstract by R. E. Thompson.)

An illustrated description of the municipal activities at Noranda, Quebec, a town fostered by the Horne Copper Co., in connection with the smelter being erected at that point. The present town of Rouyn and the new town of Noranda are situated on the shore of a small lake, from which both towns derive their water supply and which is the only possible point of discharge for the sewage of Noranda. This situation demands, of course, complete treatment of the sewage. A narrow peninsula extending well out into the lake was selected as a site for both plants, the water supply being taken from one side of the peninsula and the sewage being discharged into the lake on the other side. There is a flow line of 2½ miles between the intake and the point of sewage discharge. The sewage plant is designed to deal ultimately with a flow of 1 m. g. d. and consists of coarse bar screens, a Dorrco screen, aeration units providing retention period of 6 to 8

hours, and a Dorr clarifier. The sludge return will be about 20 per cent. During storms, when the flow exceeds 1 m. g. d., the excess will be diverted into a Dorr clarifier before being discharged into the lake. This tank will also be employed for sludge digestion. The water purification process consists of coagulation, filtration, and chlorination. The air for backwashing the filters and for aerating the sewage will be provided by air compressors located in the pumping station of the water plant. The plant is of the mechanical gravity type, with an ultimate capacity of 1 m. g. d.

Activated Sludge Plant for Wahiawa, Territory of Hawaii. F. M. Veatch. *Engineering News-Record*, vol. 100, No. 12, March 22, 1928, pp. 478–480. (Abstract by C. R. Cox.)

Wahiawa, a village of 3,000 population, is located on the island of Oahu, about 23 miles from Honolulu, on the shores of a large irrigation reservoir. A site for a sewage treatment plant was not available unless sewage could be piped about 2 miles to a point below the dam of the reservoir, where complete treatment would be necessary owing to the practically negligible flow of the stream during parts of the year. The same degree of treatment would permit the discharge of the effluent into the reservoir, so the cost of the sewer was avoided by constructing the plant near the village on the shores of the reservoir. The sewage works are designed for a population of 6,000, assuming an estimated flow of 100 gallons per capita per day. The disposal plant will consist of plain settling tanks, mixing tank, aeration tank, final settling tanks, sludge digestion tanks, glass-covered sludge drying beds, chlorination tank, and the building which houses the blowers and sludge-pumping equipment. The preliminary settling tanks are designed with a detention period of 30 minutes and are fitted with hopper bottoms. They are designed for radial flow. Sludge will flow through suitable pipes to a sump, from which it will be pumped to the digestion tanks. Sewage flows from the preliminary settling tanks to the mixing tank, where 20 per cent return sludge is mixed by air agitation. Six aeration tanks are provided, with a detention period of six hours with 20 per cent return sludge. A single row of filtros plates are placed to one side of the center line of each tank to produce spiral flow. Short-circuiting is prevented by the use of two division walls provided with square ports. Two final settling tanks of the Dorr clarifier type are provided, each 20 feet in diameter and with 1 to 2 hour detention period. At periods of low water in the reservoir the settled effluent will be disinfected with liquid chlorine. A hopper-bottom tank with a capacity of 15 minutes will be provided for the chlorine reaction. Sludge from the chlorination tank will flow by gravity to the sludge sump. A sludge-digestion tank, with capacity of 2 cubic feet per capita, is provided. This tank will be divided into six compartments so that the total length of flow from inlet to outlet will be approximately 200 feet, thus preventing the undigested sludge from reaching the outlet. A gas-collecting dome is provided over the digestion tanks, and the water level will be maintained somewhat above the level of the scum to prevent caking. The supernatant liquid from the sludge-digestion tanks will be returned to the preliminary settling tank for retreatment. Provisions have been made for circulating the digesting sludge and for adjusting the pH of the sludge by the use of lime when necessary. Covered sludge drying beds with an area of ⅜ square foot per capita are provided.

A motor-driven diaphragm pump is used to pump activated sludge, and the sludge from the other tanks will be removed by centrifugal pumps. An air pressure of 4 pounds per square inch will be produced by 3 motor-driven rotary blowers, with capacities of 100, 200, and 300 cubic feet per minute, respectively, which is equivalent to 0.25, 0.5, 0.75 cubic foot per gallon of sewage. The cost of the plant will be $96,130.

The Industrial Waste Research Problem in Southern California. R. F. Goudey. *Western Construction News*, vol. 3, No. 1, January 10, 1928, pp. 18–20. (Abstract by E. A. Reinke.)

Southern California has about 5,000 industries, many of which have serious difficulties in disposing of liquid wastes. No streams are available for dilution and inland towns will be dependent on high-grade treatment with disposal on land or in dry stream beds.

Research in industrial wastes is a logical extension of research in sewage disposal. Factors of temperature, staleness of sewage reaching plants due to low grades or long travel, and variable quality of sewage constituents due to high fruit and vegetable diets, all tend to make the problem of sewage disposal different from that in the East. The industrial wastes are also different, and separate study must be made of each kind of waste.

The only practical solution of the problem seems to be to have a research organization either as a part of the department of public health, the department of natural resources or some other State department. Private engineers can not afford to carry on this kind of research; industries will not carry it on unless forced to do so; salesmen can only try out their equipment, which is not likely to bring about fundamental solutions; student theses are not sufficiently prolonged to allow a complete solution; and the various organizations now working intermittently are not equipped to handle the work adequately.

The Sewage Treatment Works at Delaware, Ohio. Wm. L. Havens. *The American City*, vol. 38, No. 3, March, 1928, pp, 78–80. (Abstract by C. R. Cox.)

Sewage treatment works consisting of septic tanks and contact beds, built in 1902, were neglected within five years, but no improvements were made until the recent construction of the new plants of the Imhoff trickling filter type. Sewage is passed through bar screens and then pumped by low-lift pumps with automatic controls. Two Imhoff tanks, with detention period of two hours, are provided with facilities for reversing with flow. Sludge is drawn by gravity. Two dosing tanks with twin siphons are provided to alternate the flow of sewage to the two trickling filters with total area of 0.55 acre, which provides a loading of 26,400 people per acre. The filter material consists of 7 feet of broken limestone with 1 foot of crushed granite. The granite is used to prevent disintegration. Nozzles are spaced 15 feet on centers. Underdrains are vitrified channel blocks on which vitrified supports for filtering material are laid. A Dorr clarifier with 45-minute period is used as humus tank. Covered sludge drying beds will be provided later. The per capita cost of the plant was $13.92.

DEATHS DURING WEEK ENDED JUNE 2, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended June 2, 1928, and corresponding week of 1927. (From the Weekly Health Index, June 6, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended June 2, 1928	Corresponding week, 1927
Policies in force	71, 296, 695	67, 837, 137
Number of death claims	12, 482	11, 089
Death claims per 1,000 policies in force, annual rate	9. 2	8. 5

Deaths from all causes in certain large cities of the United States during the week ended June 2, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, June 6, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended June 2, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended June 2, 1928 [2]
	Total deaths	Death rate [1]		Week ended June 2, 1928	Corresponding week, 1927	
Total (67 cities)	7,649	13.3	11.8	811	684	[3] 65
Albany [4]	43	18.7	15.3	6	3	123
Atlanta	96	19.7	19.3	13	11	
White	41		15.8	3	8	
Colored	55	(5)	27.5	10	3	
Baltimore [4]	223	14.0	11.4	28	12	89
White	159		9.6	16	7	64
Colored	64	(5)	22.1	12	5	188
Birmingham	75	17.6	17.0	8	13	68
White	35		12.6	5	7	69
Colored	40	(5)	24.0	3	6	68
Boston	241	15.8	15.2	31	39	86
Bridgeport	36			0	3	0
Buffalo	181	17.0	14.1	16	20	69
Cambridge	38	15.8	11.4	0	6	0
Camden	26	10.0	12.5	4	4	64
Canton	18	8.1	12.0	4	3	95
Chicago [4]	705	11.7	11.0	91	70	78
Cincinnati	129	16.3	14.4	16	4	97
Cleveland	203	10.5	9.2	27	24	73
Columbus	64	11.3	13.1	2	5	19
Dallas	60	14.4	13.8	6	5	
White	47		11.9	5	4	
Colored	13	(5)	26.6	1	1	
Dayton	40	11.3	11.0	6	6	99
Denver	85	15.1	14.4	12	4	
Des Moines	24	8.3	8.8	7	2	116
Detroit	324	12.3	10.5	43	35	66
Duluth	20	9.0	10.0	1	0	23
El Paso	36	16.0	16.5	7	10	
Erie	27			3	4	62
Fall River [4]	44	17.1	11.0	4	5	69
Flint	30	10.5	11.3	6	3	77
Fort Worth	31	9.6	10.8	4	8	
White	21		8.0	2	6	
Colored	10	(5)	31.9	2	2	
Grand Rapids	36	11.5	8.4	2	5	30
Houston	48			11	8	
White	31			8	7	
Colored	17	(5)		3	1	
Indianapolis	77	10.5	10.3	6	6	46
White	64		10.6	5	4	44
Colored	13	(5)	8.1	1	2	61
Jersey City	79	12.7	9.7	10	4	75
Kansas City, Kans	19	8.4	10.7	1	1	21
White	9		10.3	1	1	25
Colored	10	(5)	12.3	0	0	0
Knoxville	21	10.4	20.4	4	1	87
White	10		18.0	1	1	24
Colored	11	(5)	38.5	3	0	640
Los Angeles	214			21	25	60
Louisville	115	18.3	10.9	4	3	33
White	78		9.2	1	3	10
Colored	37	(5)	20.3	3	0	207
Lowell	37	17.5	16.1	7	4	140
Lynn	30	14.9	7.0	4	1	101
Memphis	90	24.7	15.2	7	6	82
White	46		10.8	5	2	94
Colored	44	(5)	23.0	2	4	63
Milwaukee	128	12.3	12.3	6	10	27
Minneapolis	81	9.3	8.9	8	7	48

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 66 cities.
[4] Deaths for week ended Friday, June 1, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended June 2, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, June 6, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended June 2, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended June 2, 1928
	Total deaths	Death rate		Week ended June 2, 1928	Corresponding week, 1927	
Nashville	67	25.3	18.2	8	1	126
White	36		16.9	6	0	128
Colored	31	(5)	21.4	2	1	120
New Bedford	27	11.8	8.7	4	2	87
New Haven	61	17.0	6.5	10	1	141
New Orleans	165	20.1	17.8	20	20	97
White	97		14.6	10	10	73
Colored	68	(5)	26.9	10	10	145
New York	1,570	13.6	11.6	162	122	65
Bronx Borough	194	10.7	9.1	8	6	24
Brooklyn Borough	548	12.4	10.0	60	46	60
Manhattan Borough	634	18.9	16.4	70	53	94
Queens Borough	158	9.7	8.2	12	13	48
Richmond Borough	36	12.5	13.9	3	4	54
Newark, N. J	130	14.4	8.4	15	5	77
Oakland	43	8.2	10.3	5	3	54
Oklahoma City	23			0	2	
Omaha	32	7.5	12.8	0	8	0
Paterson	38	13.7	9.4	3	2	52
Philadelphia	519	13.1	10.8	33	48	44
Pittsburgh	179	13.9	14.3	30	19	98
Portland, Oreg	57			3	4	32
Providence	68	12.4	12.1	5	14	44
Richmond	61	16.4	13.6	3	5	39
White	38		10.7	1	2	20
Colored	23	(5)	20.6	2	3	73
Rochester	73	11.6	10.0	5	8	41
St. Louis	220	13.6	12.2	10	9	33
St. Paul	60	12.4	9.4	4	1	38
Salt Lake City [4]	30	11.4	8.5	3	2	49
San Antonio	80	19.2	18.7	24	22	
San Diego	45	19.7	17.2	1	3	19
San Francisco	120	11.5	15.3	8	5	50
Schenectady	22	12.3	9.0	1	2	31
Seattle	59	8.1	11.4	6	4	62
Somerville	36	18.3	5.6	6	1	207
Spokane	22	10.5	11.0	4	1	103
Springfield, Mass	28	9.8	8.8	0	2	0
Syracuse	57	15.0	11.1	8	2	97
Toledo	56	9.3	12.0	4	7	38
Trenton	42	15.8	12.6	7	3	119
Washington, D. C	127	12.0	11.4	4	5	23
White	85		9.6	2	3	17
Colored	42	(5)	16.8	2	2	37
Waterbury	17			2	0	58
Wilmington, Del	40	16.3	9.1	4	4	105
Worcester	53	14.0	14.4	6	6	73
Yonkers	21	9.1	7.0	2	3	40
Youngstown	40	12.0	6.8	5	4	67

[4] Deaths for week ended Friday, June 1, 1928.

[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 9, 1928, and June 11, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 9, 1928, and June 11, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 9, 1928	Week ended June 11, 1927	Week ended June 9, 1928	Week ended June 11, 1927	Week ended June 9, 1928	Week ended June 11, 1927	Week ended June 9, 1928	Week ended June 11, 1927
New England States:								
Maine	2	3	41	10	40	115	0	0
New Hampshire					26		0	
Vermont		2			49	57	0	0
Massachusetts	66	88	51	1	767	475	3	4
Rhode Island	6	6	2		196	1	0	0
Connecticut	11	31	2	2	340	67	0	0
Middle Atlantic States:								
New York	362	443	[1] 52	[1] 15	3,833	951	37	5
New Jersey	152	112	70	4	1,646	69	2	2
Pennsylvania	141	162			2,002	474	19	2
East North Central States:								
Ohio	54		38		785		3	
Indiana	17	30	17	2	331	77	0	0
Illinois	112	87	68	11	195	532	6	9
Michigan	90	82	10	4	1,007	204	9	5
Wisconsin	16	26	126	21	116	797	6	20
West North Central States.								
Minnesota	18	23	3	2	87	81	2	2
Iowa	11	21				135	2	1
Missouri	25	25	5		291	113	5	2
North Dakota	3	1	127		20	23	0	0
South Dakota		5			66	39	0	0
Nebraska	11	9	1		43	100	0	0
Kansas	7	5	3		76	414	2	2
South Atlantic States.								
Delaware		1			10	5	0	0
Maryland [2]	36	62	10	3	318	13	0	1
District of Columbia	18	13	1		192	3	0	0
Virginia								
West Virginia	11	12	115	3	51	210	1	1
North Carolina	19	13			576	1,404	0	0
South Carolina	14	6	287	183	133	239	0	0
Georgia	8	7	32	27	75	43	2	0
Florida	3	17	24	29	79	49	0	0
East South Central States:								
Kentucky	7		2		96		3	
Tennessee	4	5	77	3	86	58	1	0
Alabama	8	5	110	6	219	221	0	1
Mississippi	1	6					1	0
West South Central States:								
Arkansas	8	5	[1] 120	17	181	51	0	0
Louisiana	15	11	61	18	146	70	3	0
Oklahoma [3]	7	7	51	17	177	290	1	0
Texas	26	17	10	34	237	204	0	0
Mountain States:								
Montana	4				13	16	2	2
Idaho						23	1	0
Wyoming			6		5	55	0	0
Colorado	6	30		1	67	129	1	1

[1] New York City only. [2] Week ended Friday. [3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 9, 1928, and June 11, 1927—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 9, 1928	Week ended June 11, 1927	Week ended June 9, 1928	Week ended June 11, 1927	Week ended June 9, 1928	Week ended June 11, 1927	Week ended June 9, 1928	Week ended June 11, 1927
Mountain States—Continued								
New Mexico		2			13	85	0	0
Arizona	2	9	28	2	14	105	1	0
Utah [2]	1	7	2		2	9	1	0
Pacific States:								
Washington	15	6			62	352	2	3
Oregon	5	5	3	7	24	183	0	1
California	76	113	34	16	71	649	3	5

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 9, 1928	Week ended June 11, 1927	Week ended June 9, 1928	Week ended June 11, 1927	Week ended June 9, 1928	Week ended June 11, 1927	Week ended June 9, 1928	Week ended June 11, 1927
New England States:								
Maine	0	0	17	24	0	0	2	2
New Hampshire	0		2		0		0	
Vermont	0	0	4	0	0	0	0	0
Massachusetts	2	4	201	389	0	0	1	6
Rhode Island	0	1	24	12	0	0	0	0
Connecticut	0	0	39	89	3	0	2	2
Middle Atlantic States:								
New York	2	1	420	606	2	2	9	10
New Jersey	3	3	149	212	0	0	0	3
Pennsylvania	1	1	225	321	1	1	24	17
East North Central States:								
Ohio	1		186		21		6	
Indiana	0	0	47	109	76	134	3	4
Illinois	2	0	239	181	22	3	9	15
Michigan	2	1	303	190	97	59	2	7
Wisconsin	1	0	168	165	2	26	16	3
West North Central States:								
Minnesota	0	0	81	125	0	4	5	6
Iowa	0	0	44	26	54	6	0	2
Missouri	0	0	50	31	79	17	1	6
North Dakota	0	0	24	16	2	0	0	0
South Dakota	0	0	15	10	1	3	8	7
Nebraska	0	0	50	27	33	11	0	0
Kansas	0	1	52	27	45	7	3	4
South Atlantic States:								
Delaware	1	0	0	5	0	0	2	2
Maryland [2]	1	0	38	44	0	0	6	9
District of Columbia	0	0	44	21	1	2	0	1
Virginia		0				1		
West Virginia	1	0	15	46	5	30	4	13
North Carolina	1	0	23	6	57	26	11	19
South Carolina	2	0	5	2	14	14	30	134
Georgia	0	0	9	9	0	17	8	62
Florida	1	1	1	5	2	44	5	19
East South Central States:								
Kentucky	0		37		10		2	
Tennessee	0	0	18	2	8	12	11	32
Alabama	0	1	2	6	7	41	14	45
Mississippi	1	0	3	6	1	1	13	24
West South Central States:								
Arkansas	0	2	7	10	1	1	5	22
Louisiana	0	2	8	3	10	6	28	17
Oklahoma [3]	1	1	38	25	82	46	4	38
Texas	0	2	84	7	53	49	29	34
Mountain States:								
Montana	0	0	11	17	16	14	15	2
Idaho	0	0	1	2	2	3	0	2
Wyoming	0	0	11	8	1	1	15	0
Colorado	0	0	18	45	3	1	0	7
New Mexico	0	0	11	4	1	0	1	1
Arizona	0	5	8	27	0	0	7	3
Utah [2]	0	0	7	26	7	3	0	0
Pacific States:								
Washington	2	0	29	36	13	19	4	4
Oregon	0	0	9	9	22	8	1	0
California	6	4	126	141	9	20	13	1

[2] Week ended Friday. [3] Exclusive of Tulsa.

Report for Week Ended June 2, 1928

COLORADO

	Cases
Diphtheria	5
Measles	119
Poliomyelitis	2

COLORADO—continued

	Cases
Scarlet fever	37
Smallpox	8
Typhoid fever	2

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April, 1928										
Hawaii Territory	6	31	8		18		0	4	0	12
Montana	15	23	168		30		2	87	105	2
Virginia	7	80	2,879	63	3,348	35	5	161	33	29
Washington	19	41	55		662		6	190	195	17
May, 1928										
Alabama	4	40	1,141	142	1,348	102	4	30	51	26

April, 1928

	Cases
Chicken pox:	
Hawaii Territory	49
Montana	71
Virginia	628
Washington	401
Conjunctivitis (follicular):	
Hawaii Territory	159
Dysentery:	
Virginia	50
German measles:	
Montana	4
Washington	37
Hookworm disease:	
Virginia	9
Impetigo contagiosa:	
Washington	16
Leprosy:	
Hawaii Territory	7
Lethargic encephalitis:	
Montana	1
Washington	4
Mumps:	
Hawaii Territory	30
Montana	7
Washington	368
Paratyphoid fever:	
Hawaii Territory	1
Rocky Mountain spotted or tick fever:	
Montana	4
Washington	1
Scabies	
Washington	6
Trachoma	
Hawaii Territory	160
Montana	1
Whooping cough:	
Hawaii Territory	2
Montana	42
Virginia	500
Washington	61

May, 1928

	Cases
Alabama:	
Chicken pox	156
Dengue	2
Lethargic encephalitis	4
Mumps	89
Whooping cough	107

Number of Cases of Certain Communicable Diseases Reported for the Month of March, 1928, by State Health Officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	115	26	245	302	158	0	36	12	172
New Hampshire	...	17	...	...	93	0	...	0	...
Vermont	170	8	325	448	60	0	17	1	141
Massachusetts	974	411	8,227	1,496	1,408	0	604	13	1,198
Rhode Island	34	44	481	185	225	0	53	1	23
Connecticut	417	108	1,574	1,269	453	4	198	3	572
New York	2,732	1,583	10,394	3,464	3,912	37	2,199	79	2,024
New Jersey	862	557	5,345	...	1,303	24	499	18	568
Pennsylvania	2,888	954	6,670	4,611	2,620	2	797	53	1,307
Ohio	1,530	577	4,598	2,322	1,289	187	694	35	728
Indiana	425	132	1,038	713	720	710	149	11	169
Illinois	1,738	643	896	1,743	1,669	232	1,257	42	1,131
Michigan	663	281	5,813	2,398	1,229	161	436	19	651
Wisconsin	1,306	147	583	1,413	1,142	118	190	14	495
Minnesota	748	97	350	...	760	21	278	22	215
Iowa	244	56	173	395	343	257	114	4	33
Missouri	439	246	1,349	1,188	628	296	275	10	404
North Dakota	66	22	15	94	309	6	18	10	46
South Dakota	90	11	168	57	273	55	15	7	55
Nebraska	330	52	137	437	582	255	10	1	59
Kansas	592	52	410	649	729	386	179	5	349
Delaware	14	5	54	45	22	0	[1] 5	0	5
Maryland	557	139	4,699	166	310	6	274	16	251
District of Columbia	115	89	744	...	226	13	107	2	43
Virginia	657	153	3,753	...	233	39	[1] 107	22	590
West Virginia	303	112	628	...	241	391	76	33	75
North Carolina	848	237	14,823	...	126	477	...	12	661
South Carolina	427	241	5,043	79	31	49	228	15	463
Georgia	330	59	1,091	140	101	70	[1] 92	19	58
Florida	425	56	227	66	35	40	94	33	43
Kentucky [2]	...	...	...	...	...	...	...	...	...
Tennessee	206	85	2,158	396	171	148	237	31	125
Alabama	365	108	2,321	223	76	67	413	51	103
Mississippi	894	77	8,536	1,507	64	31	320	51	1,579
Arkansas	137	18	1,986	195	81	27	[1] 38	22	107
Louisiana	79	96	1,202	24	63	122	[1] 125	30	31
Oklahoma [3]	148	99	1,694	168	241	859	61	29	61
Texas [2]	...	...	...	...	...	...	...	...	...
Montana	54	34	9	1	55	80	45	3	56
Idaho	83	4	2	100	149	41	[1] 5	5	7
Wyoming	60	1	254	48	83	32	...	1	25
Colorado [4]	...	...	...	...	...	...	...	...	...
New Mexico [2]	...	...	...	...	...	...	...	...	...
Arizona	58	20	109	56	26	132	69	8	23
Utah [2]	...	...	...	...	...	...	...	...	...
Nevada [5]	...	...	...	...	...	...	...	...	...
Washington	463	54	1,205	449	195	203	229	21	53
Oregon	238	55	495	96	95	347	61	12	6
California	3,402	454	1,001	1,530	765	98	906	32	772

[1] Pulmonary.
[2] Reports received weekly.
[3] Exclusive of Oklahoma City and Tulsa.
[4] Reports not received at time of going to press.
[5] Reports received annually.

Case Rates per 1,000 Population (Annual Basis) for the Month of March, 1928

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	1.71	0.39	3.64	4.49	2.35	0.00	0.53	0.18	2.55
New Hampshire	------	.44	------	------	2.41	.00	------	.00	------
Vermont	5.70	.10	10.89	15.01	2.01	.00	.57	.03	4.72
Massachusetts	2.68	1.13	22.64	4.12	3.87	.00	1.66	.04	3.30
Rhode Island	.56	.73	7.93	3.05	3.71	.00	.87	.02	.38
Connecticut	2.95	.76	11.15	8.99	3.21	.03	1.40	.02	4.05
New York	2.79	1.62	10.62	3.54	4.00	.04	2.25	.08	2.07
New Jersey	2.66	1.72	16.52	------	4.03	.07	1.54	.06	1.76
Pennsylvania	3.46	1.14	7.99	5.52	3.14	.00	.95	.06	1.57
Ohio	2.65	1.00	7.95	4.02	2.23	.32	1.20	.06	1.26
Indiana	1.58	.49	3.86	2.65	2.68	2.64	.55	.04	.63
Illinois	2.77	1.03	1.43	2.78	2.66	.37	2.01	.07	1.81
Michigan	1.71	.72	14.95	6.17	3.16	.41	1.12	.05	1.67
Wisconsin	5.22	.59	2.33	5.65	4.57	.47	.76	.06	1.98
Minnesota	3.24	.42	1.52	------	3.30	.09	1.21	.10	.93
Iowa	1.19	.27	.84	1.92	1.67	1.25	.55	.02	.16
Missouri	1.47	.82	4.52	3.98	2.10	.99	.92	.03	1.35
North Dakota	1.22	.41	.28	1.73	5.69	.11	.33	.18	.85
South Dakota	1.51	.18	2.82	.96	4.58	.92	.25	.12	.92
Nebraska	2.77	.44	1.15	3.66	4.88	2.14	.08	.01	.49
Kansas	3.81	.33	2.64	4.18	4.69	2.48	1.15	.03	2.25
Delaware	.68	.24	2.61	2.18	1.06	.00	[1] .24	.00	.24
Maryland	4.07	1.02	34.33	1.21	2.26	.04	2.00	.12	1.83
District of Columbia	2.46	1.90	15.91	------	4.83	.28	2.29	.04	.92
Virginia	3.01	.70	17.21	------	1.07	.18	[1] .49	.10	2.71
West Virginia	2.07	.77	4.30	------	1.65	2.68	.52	.23	.51
North Carolina	3.41	.95	59.57	------	.51	1.92	------	.05	2.66
South Carolina	2.70	1.53	31.94	.50	.20	.31	1.44	.10	2.93
Georgia	1.22	.22	4.02	.52	.37	.26	[1] .34	.07	.21
Florida	3.56	.47	1.90	.55	.29	.33	.79	.28	.36
Kentucky [2]	------	------	------	------	------	------	------	------	------
Tennessee	.97	.40	10.18	1.87	.81	.70	1.12	.15	.59
Alabama	1.67	.50	10.65	1.02	.35	.31	1.90	.23	.47
Mississippi	5.90	.51	56.29	9.94	.42	.20	2.11	.34	10.41
Arkansas	.83	.11	12.06	1.18	.49	.16	[1] .23	.13	.65
Louisiana	.48	.58	7.28	.15	.38	.74	[1] .76	.18	.19
Oklahoma [3]	.81	.54	9.32	.92	1.33	4.73	.34	.16	.34
Texas [2]	------	------	------	------	------	------	------	------	------
Montana	1.16	.73	.19	.02	1.18	1.72	.97	.06	1.20
Idaho	1.79	.09	.04	2.16	3.22	.89	[1] .11	.11	.15
Wyoming	2.87	.05	12.14	2.29	3.97	1.53	------	.05	1.19
Colorado [4]	------	------	------	------	------	------	------	------	------
New Mexico [5]	------	------	------	------	------	------	------	------	------
Arizona	1.44	.72	2.71	1.39	.65	3.29	1.72	.20	.57
Utah [2]	------	------	------	------	------	------	------	------	------
Nevada [5]	------	------	------	------	------	------	------	------	------
Washington	3.44	.40	8.96	3.34	1.45	1.51	1.70	.16	.39
Oregon	3.12	.72	6.48	1.26	1.24	4.54	.80	.16	.08
California	8.81	1.18	2.59	3.96	1.98	.25	2.35	.08	2.00

[1] Pulmonary.
[2] Reports received weekly.
[3] Exclusive of Oklahoma City and Tulsa.
[4] Reports not received at time of going to press.
[5] Reports received annually.

PLAGUE-PREVENTION WORK IN THE UNITED STATES

California.—The weekly reports of plague-suppressive measures in California during the 10 weeks from March 11 to May 19, 1928, show a total of 7,968 rodents received and 6,728 examined during the period. None was reported plague infected. The last rodent infection reported was six ground squirrels February 25–28, 1928, in Santa Cruz, Calif. The last case of human plague was reported as occurring on February 9, 1928, also in Santa Cruz, Calif.

Los Angeles, Calif.—The rodent division of the Los Angeles Board of Health reports 8,485 rodents collected and 4,767 examined during the nine weeks from March 18 to May 19, 1928. None was found plague infected.

Seattle, Wash.—The report of rat-trapping operations at Seattle for the months of March and April, 1928, show a total of 2,460 rodents taken and 1,197 examined during the two months. None was found plague infected.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 100 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,570,000. The estimated population of the 95 cities reporting deaths is more than 30,960,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended May 26, 1928, and May 28, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
41 States	1,351	1,567	
100 cities	778	1,016	841
Measles:			
39 States	16,597	10,807	
100 cities	7,900	3,225	
Poliomyelitis:			
41 States	27	21	
Scarlet fever:			
41 States	3,424	3,777	
100 cities	1,416	1,747	1,118
Smallpox:			
41 States	822	637	
100 cities	105	170	110
Typhoid fever:			
41 States	282	407	
100 cities	50	56	63
Deaths reported			
Influenza and pneumonia:			
95 cities	1,187	633	
Smallpox:			
95 cities	0	0	

City reports for week ended May 26, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	11	1	0	0	0	24	11	4
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	5	0	0
Manchester	84,000	0	1	0	0	0	0	0	5
Vermont:									
Barre	[1] 10,008	2	0	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	24	44	10	8	2	96	5	45
Fall River	131,000	2	3	2	1	2	14	0	2
Springfield	145,000	2	2	1	2	1	2	18	7
Worcester	193,000	9	3	4	0	1	54	12	4
Rhode Island:									
Pawtucket	71,000	3	1	0	0	0	19	16	4
Providence	275,000	0	6	0	0	1	187	3	14
Connecticut:									
Bridgeport	(2)	0	5	7	0	1	19	0	6
Hartford	[1] 161,000	8	5	3	0	0	86	7	16
New Haven	182,000	15	2	1	3	0	55	25	8
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	14	9	12		0	49	45	19
New York	5,924,000	186	254	318	78	20	2,549	42	265
Rochester	321,000	9	10	4		2	128	20	5
Syracuse	185,000	30	4	6		6	169	7	4
New Jersey:									
Camden	131,000	3	5	13	1	1	72	2	3
Newark	459,000	19	11	29	5	3	215	6	17
Trenton	134,000	1	3	2	0	0	15	1	7
Pennsylvania:									
Philadelphia	2,008,000	46	66	35	0	7	1,160	45	65
Pittsburgh	637,000	32	18	17	0	10	108	44	44
Reading	114,000	9	2	1	0	0	21	1	4
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	10	8	1	0	5	17	0	14
Cleveland	960,000	61	22	28	15	11	109	68	29
Columbus	285,000	1	3	1	4	0	136	2	4
Toledo	295,000	27	4	5	5	5	158	6	6
Indiana:									
Fort Wayne	99,900	2	2	2	0	1	0	0	4
Indianapolis	367,000	46	4	4	0	0	144	0	21
South Bend	81,700	0	1	0	0	0	3	0	1
Terre Haute	71,900	2	1	0	0	0	3	0	2
Illinois:									
Chicago	3,048,000	72	72	77	27	15	59	31	122
Springfield	64,700	2	0	6	1	0	0	4	6
Michigan:									
Detroit	[1] 1,242,044	24	45	33	15	10	447	15	46
Flint	136,000	6	4	3	0	0	258	12	8
Grand Rapids	156,000	0	2	0	0	2	7	9	0

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended May 26, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha	52,700	24	1	0	0	0	1	2	3
Milwaukee	517,000	37	12	7	5	5	2	10	9
Racine	69,400	1	0	0	1	1	1	1	3
Superior	[1] 39,671	0	1	0	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	10	0	1	0	1	0	3	2
Minneapolis	434,000	32	15	5	0	2	82	172	5
St. Paul	248,000	13	10	1	0	1	12	21	9
Iowa:									
Davenport	[1] 52,469	0	0	2	0	0	0	0	--------
Des Moines	146,000	0	2	0	0	--------	0	0	--------
Sioux City	78,000	--------	1	--------	--------	--------	--------	--------	--------
Waterloo	36,900	12	0	0	0	--------	1	4	--------
Missouri:									
Kansas City	375,000	23	5	2	0	0	64	37	9
St. Joseph	78,400	0	1	0	0	0	1	0	4
St. Louis	830,000	14	37	25	0	0	299	12	--------
North Dakota:									
Fargo	[1] 26,403	2	0	0	0	1	0	0	1
Grand Forks	[1] 14,811	0	0	0	0	--------	0	0	--------
South Dakota:									
Aberdeen	[1] 15,036	0	0	0	0	--------	0	0	--------
Sioux Falls	[1] 30,127	0	0	0	0	--------	0	0	--------
Nebraska:									
Omaha	216,000	6	1	2	0	0	2	6	9
Kansas:									
Topeka	56,500	10	1	0	1	1	10	5	0
Wichita	92,500	4	1	1	0	0	11	0	2
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	0	1	4	0	0	8	2	5
Maryland:									
Baltimore	808,000	53	22	22	1	2	300	59	25
Cumberland	[1] 33,741	0	1	0	0	0	3	0	0
Frederick	[1] 12,035	0	0	0	0	0	12	0	0
District of Columbia:									
Washington	528,000	11	10	27	1	1	191	0	9
Virginia:									
Lynchburg	[3] 38,493	4	0	0	0	0	30	5	0
Norfolk	174,000	1	0	1	0	0	4	5	6
Richmond	189,000	2	1	1	0	1	53	1	3
Roanoke	61,900	5	0	1	0	0	14	0	0
West Virginia:									
Charleston	50,700	1	0	2	0	0	3	0	3
Wheeling	[1] 56,208	3	1	0	0	0	1	0	1
North Carolina:									
Raleigh	[1] 30,371	0	0	0	0	0	22	0	2
Wilmington	37,700	4	0	0	0	0	2	1	0
Winston-Salem	71,800	14	1	0	0	0	7	16	0
South Carolina:									
Charleston	74,100	0	0	1	6	0	3	0	0
Columbia	41,800	8	0	0	0	0	1	14	7
Greenville	[1] 27,311	1	0	0	0	0	1	0	0
Georgia:									
Atlanta	(2)	6	1	2	12	0	27	10	3
Brunswick	[1] 16,809	2	0	0	0	0	10	13	0
Savannah	94,900	5	0	0	9	2	1	1	3
Florida:									
Miami	[3] 131,286	6	4	0	0	0	1	2	2
St. Petersburg	[3] 47,629	--------	0	--------	--------	0	--------	--------	0
Tampa	102,000	0	1	1	0	0	2	1	1

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census

City reports for week ended May 26, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST SOUTH CENTRAL									
Kentucky									
Covington	58,500	1	0	0	0	0	2	0	4
Louisville	311,000	3	3	1	5	0	110	12	11
Tennessee									
Memphis	177,000	9	1	0	0	3	6	13	10
Nashville	137,000	2	0	6	0	3	36	4	1
Alabama									
Birmingham	211,000	5	0	0	77	10	46	7	17
Mobile	66,800	0	1	0	1	1	2	0	1
Montgomery	47,000	3	0	0	1		14	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	1	0	0	0		3	0	
Little Rock	75,900	1	0	0	0	2	8	2	6
Louisiana									
New Orleans	419,000	3	6	3	8	5	3	0	12
Shreveport	59,500	0	0	0	0	0	8	0	5
Oklahoma									
Oklahoma City	(2)	2	1	2	22	1	22	5	8
Texas									
Dallas	203,000	22	3	2	0	0	29	0	2
Fort Worth	159,000	15	1	1	0	1	4	1	4
Galveston	49,100	1	0	0	0	0	0	1	2
Houston	[1] 164,954	0	3	2	0	0	12	0	2
San Antonio	205,000	1	1	0	0	1	2	0	6
MOUNTAIN									
Montana:									
Billings	[1] 17,971	4	0	0	0	0	0	0	0
Great Falls	[1] 29,883	5	0	0	0	0	6	2	0
Helena	[1] 12,037	0	0	1	0	0	2	0	0
Missoula	[1] 12,668	2	0	0	0	0	0	0	0
Idaho									
Boise	[1] 23,042	1	0	0	0	0	0	0	0
Colorado									
Denver	285,000	40	9	5		5	66	67	10
Pueblo	43,900	25	1	0	0	0	20	0	1
New Mexico:									
Albuquerque	[1] 21,000	3	1	0	0	0	1	0	0
Utah									
Salt Lake City	133,000	15	3	2	0	1	0	0	3
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	56	5	1	0		54	5	
Spokane	[1] 109,000	30	2	3	0		0	0	
Tacoma	106,000	1	1	0	0	0	25	72	4
Oregon:									
Portland	[1] 282,383	16	5	5	0	0	23	7	4
California:									
Los Angeles	(2)	101	38	23	31	0	22	47	18
Sacramento	73,400	8	3	2	0	0	5	13	2
San Francisco	567,000	43	18	7	4	2	13	37	3

[1] Estimated July 1, 1925. [2] No estimate made.

City reports for week ended May 26, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	2	2	0	0	0	0	0	0	1	6	23
New Hampshire:											
Concord	1	1	0	0	0	1	0	0	0	0	13
Manchester	1	0	0	0	0	1	0	0	0	0	36
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	3
Massachusetts:											
Boston	62	72	0	4	0	15	1	3	0	18	250
Fall River	3	4	0	0	0	5	1	0	0	6	38
Springfield	6	11	0	0	0	0	0	0	0	2	38
Worcester	9	5	0	0	0	2	1	0	0	13	68
Rhode Island:											
Pawtucket	1	4	0	0	0	2	0	0	0	0	22
Providence	8	23	0	0	0	4	0	2	0	1	79
Connecticut:											
Bridgeport	10	4	0	0	0	0	0	0	0	4	29
Hartford	4	6	0	0	0	3	1	0	0	3	77
New Haven	6	1	0	0	0	1	1	0	0	22	48
MIDDLE ATLANTIC											
New York:											
Buffalo	19	25	0	0	0	14	0	0	0	18	149
New York	238	315	0	0	0	115	10	9	0	133	1,671
Rochester	12	12	0	0	0	1	1	1	0	6	84
Syracuse	8	18	0	0	0	2	0	1	0	25	52
New Jersey:											
Camden	5	0	0	0	0	0	1	0	0	4	37
Newark	23	38	0	0	0	6	0	0	0	36	124
Trenton	2	1	0	0	0	4	1	0	0	0	56
Pennsylvania:											
Philadelphia	83	103	1	0	0	41	4	1	0	79	521
Pittsburgh	29	25	0	0	0	7	0	0	0	33	218
Reading	3	11	0	0	0	0	1	0	0	10	29
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	13	41	2	4	0	14	0	1	1	2	160
Cleveland	32	27	0	0	0	19	1	1	0	43	240
Columbus	8	12	2	0	0	5	0	0	0	6	84
Toledo	11	3	2	0	0	3	0	0	0	5	89
Indiana:											
Fort Wayne	3	2	3	0	0	2	0	1	0	1	32
Indianapolis	9	15	14	6	0	6	1	0	0	4	96
South Bend	3	1	0	0	0	0	0	0	0	0	7
Terre Haute	3	0	1	0	0	1	0	0	0	0	13
Illinois:											
Chicago	106	81	2	3	0	46	3	3	0	82	746
Springfield	3	6	0	0	0	2	0	1	1	2	22
Michigan:											
Detroit	82	111	1	5	0	27	2	1	0	73	318
Flint	5	7	1	1	0	0	0	0	0	8	33
Grand Rapids	6	3	0	5	0	0	0	0	0	5	27
Wisconsin:											
Kenosha	2	1	1	0	0	0	0	0	0	15	7
Milwaukee	19	62	1	0	0	11	0	0	0	17	122
Racine	4	3	1	0	0	0	0	0	0	1	12
Superior	2	16	1	0	0	3	0	0	0	0	12
WEST NORTH CENTRAL											
Minnesota:											
Duluth	7	4	1	0	0	2	1	0	0	5	32
Minneapolis	35	21	7	0	0	2	1	0	0	20	92
St. Paul	21	11	3	0	0	4	1	0	0	56	56
Iowa:											
Davenport	0	2	1	2			0	0		0	
Des Moines	6	5	2	15			0	0		0	
Sioux City	1		2				0				
Waterloo	1	8	0	0			0	0		3	

City reports for week ended May 26, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST NORTH CENTRAL—continued											
Missouri:											
Kansas City	8	31	1	1	0	0	1	1	0	15	100
St. Joseph	2	1	1	0	0	0	0	0	0	2	40
St. Louis	29	18	3	3	0	13	2	1	0	19	228
North Dakota:											
Fargo	1	1	0	0	0	1	0	0	0	8	10
Grand Forks	0	1	0	0			0	0		0	
South Dakota:											
Aberdeen	2	0	0	0			0	0		1	
Sioux Falls	1	0	0	0			0	0		0	
Nebraska:											
Omaha	3	3	7	7	0	2	0	0	0	2	65
Kansas:											
Topeka	2	6	0	0	0	0	0	0	0	4	11
Wichita	2	2	1	3	0	0	0	0	0	0	32
SOUTH ATLANTIC											
Delaware:											
Wilmington	4	2	0	0	0	0	0	0	0	0	31
Maryland:											
Baltimore	33	28	0	0	0	16	2	1	1	52	218
Cumberland	1	0	0	0	0	1	0	0	0	0	12
Frederick	0	0	0	0	0	0	0	0	0	0	4
District of Columbia:											
Washington	19	46	1	4	0	13	1	0	0	2	144
Virginia:											
Lynchburg	0	2	1	0	0	1	0	0	0	3	17
Norfolk	2	1	0	0	0	3	1	1	0	0	
Richmond	3	1	1	0	0	1	0	0	0	0	39
Roanoke	1	1	1	0	0	0	0	0	0	0	16
West Virginia:											
Charleston	0	1	0	0	0	2	0	0	1	0	23
Wheeling	1	0	0	0	0	0	0	0	0	0	23
North Carolina:											
Raleigh	0	1	0	2	0	1	0	0	0	1	13
Wilmington	1	0	0	0	0	0	1	0	0	0	4
Winston-Salem	0	1	2	1	0	2	0	1	0	0	13
South Carolina:											
Charleston	0	0	1	3	0	1	1	1	0	1	22
Columbia	0	1	0	0	0	2	1	0	0	1	36
Greenville	0	0	0	0	0	2	0	0	0	0	12
Georgia:											
Atlanta	3	8	7	5	0	6	1	0	1	3	72
Brunswick	0	0	0	0	0	0	1	0	0	0	6
Savannah	0	0	1	0	0	2	1	0	0	0	35
Florida:											
Miami	0	0	0	0	0	1	1	0	0	0	22
St. Petersburg	0		0		0	0	0		0		8
Tampa	1	0	0	0	0	3	1	0	0	0	24
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	5	1	0	0	1	1	0	0	0	25
Louisville	6	32	0	3	0	15	1	0	0	4	145
Tennessee:											
Memphis	5	1	2	1	0	6	1	1	2	0	73
Nashville	2	2	2	7	0	7	1	1	0	2	41
Alabama:											
Birmingham	1	1	6	1	0	4	2	0	0	6	82
Mobile	0	1	0	0	0	2	1	0	1	0	22
Montgomery	1	2	1	0			0	0		0	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	2	0	0			0	0		5	
Little Rock	1	20	0	1	0	1	1	0	0	1	

City reports for week ended May 26, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL—continued											
Louisiana:											
New Orleans	3	10	1	0	0	20	2	1	1	10	168
Shreveport	1	1	1	0	0	2	0	0	0	1	26
Oklahoma:											
Oklahoma City	2	8	2	12	0	1	9 0	0	0	0	41
Texas:											
Dallas	2	15	3	3	0	1	1	0	0	21	46
Fort Worth	1	8	3	2	0	0	0	0	0	0	26
Galveston	0	0	0	0	0	0	0	2	0	0	15
Houston	1	3	0	2	0	1	0	0	0	1	63
San Antonio	0	0	0	0	0	10	0	0	0	0	87
MOUNTAIN											
Montana:											
Billings	0	0	0	1	0	0	0	0	0	2	8
Great Falls	3	0	1	4	0	0	0	0	0	2	9
Helena	0	0	0	1	0	1	0	0	0	0	3
Missoula	0	0	0	0	0	1	0	0	0	0	4
Idaho:											
Boise	0	0	1	0	0	0	0	0	0	2	3
Colorado:											
Denver	11	2	0	1	0	9	0	0	0	21	89
Pueblo	1	0	1	1	0	1	1	0	0	0	17
New Mexico:											
Albuquerque	0	0	0	0	0	2	0	0	0	0	8
Utah:											
Salt Lake City	2	0	1	6	0	2	0	0	0	17	25
Nevada:											
Reno	0	0	0	1	0	0	0	0	0	0	8
PACIFIC											
Washington:											
Seattle	9	8	2	3	--------	-------	0	3	--------	9	--------
Spokane	5	0	4	7	--------	-------	1	0	--------	0	--------
Tacoma	2	3	3	0	0	1	0	0	0	2	16
Oregon:											
Portland	5	14	8	29	0	1	0	2	0	0	79
California:											
Los Angeles	25	14	7	5	0	19	2	1	0	59	239
Sacramento	1	6	1	0	0	2	1	1	0	1	24
San Francisco	16	20	2	0	0	9	0	9	0	5	147

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	2	1	1	0	0	0	0	0
Connecticut:									
Bridgeport	1	1	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	34	11	4	5	0	0	1	0	1
New Jersey:									
Newark	1	0	0	0	0	0	0	1	0
Pennsylvania:									
Philadelphia	2	1	0	0	0	0	0	0	0
Pittsburgh	0	0	1	1	0	0	0	0	0

City reports for week ended May 26, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cleveland	3	2	0	0	0	0	0	0	0
Columbus	0	0	0	0	0	0	0	1	1
Illinois:									
Chicago	11	9	1	1	0	0	0	0	0
Michigan									
Detroit	2	1	0	0	0	0	0	1	0
Grand Rapids	1	0	0	0	0	0	0	0	0
Wisconsin									
Milwaukee	2	2	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	1	1	0	0	0	0	1	0
Missouri:									
Kansas City	3	4	0	1	0	0	0	0	0
St. Louis	10	5	0	0	0	0	0	0	0
Nebraska:									
Omaha	1	0	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	0	0	0	0	0	1	0
District of Columbia:									
Washington	0	0	1	1	0	0	0	0	0
South Carolina.									
Charleston	0	0	0	0	1	0	0	0	0
Columbia	0	0	0	0	0	3	0	0	0
Georgia:									
Atlanta	0	0	0	0	0	1	0	0	0
Savannah	0	0	0	0	2	2	0	0	0
Florida									
Tampa	1	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee.									
Memphis	0	0	0	0	1	0	0	0	0
Alabama									
Birmingham	0	0	0	0	2	0	0	0	0
Mobile	0	0	0	0	3	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	1	0	0	0	0	0	0	0	0
Little Rock	1	0	0	0	0	0	0	0	0
Louisiana:									
New Orleans	2	0	0	1	5	0	0	0	0
Texas:									
Dallas	0	0	0	0	2	1	0	1	0
Utah									
Salt Lake City	1	0	0	0	0	0	0	0	0
Nevada:									
Reno	1	0	0	0	0	0	0	0	0
PACIFIC									
California:									
Los Angeles	1	0	0	0	0	0	1	0	0
Sacramento	0	0	0	0	0	1	0	0	0
San Francisco	1	0	0	0	0	0	0	0	0

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended May 26, 1928, compared with those for a like period ended May 28, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many of the

cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, April 22 to May 26, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927
101 cities	128	171	123	183	121	174	137	174	[2] 129	171
New England	133	95	133	130	113	105	110	153	64	160
Middle Atlantic	172	242	170	272	177	282	204	267	213	238
East North Central	131	137	107	159	109	132	114	160	102	145
West North Central	84	158	78	131	55	135	95	105	[2] 74	91
South Atlantic	86	105	88	119	82	115	103	110	109	144
East South Central	45	76	40	76	35	81	20	35	35	96
West South Central	100	178	80	141	92	112	64	50	28	83
Mountain	133	99	80	152	71	99	97	108	71	143
Pacific	56	188	125	110	102	94	120	104	92	196
MEASLES CASE RATES										
101 cities	1,290	638	1,423	696	1,376	602	1,346	620	[2] 1,308	548
New England	1,593	323	1,322	270	1,120	346	1,159	416	1,290	435
Middle Atlantic	1,862	231	2,236	212	2,254	297	2,274	323	2,185	365
East North Central	728	637	794	564	788	450	680	492	773	372
West North Central	1,017	1,225	888	1,522	937	932	1,116	952	[2] 968	653
South Atlantic	1,767	1,017	2,109	1,577	1,704	1,546	1,436	1,537	1,219	1,358
East South Central	1,521	375	1,132	517	1,082	345	1,237	355	1,077	319
West South Central	396	922	392	877	336	567	[illegible]	620	250	459
Mountain	840	1,542	752	1,632	1,141	1,300	1,150	906	831	1,049
Pacific	386	1,528	266	1,601	327	1,259	263	1,215	304	1,060
SCARLET FEVER CASE RATES										
101 cities	266	339	258	360	253	340	253	309	[2] 234	294
New England	329	402	345	393	347	439	292	432	306	365
Middle Atlantic	312	446	303	540	285	474	279	415	267	363
East North Central	281	289	254	283	265	289	272	267	254	301
West North Central	275	333	218	271	242	319	279	289	[2] 213	245
South Atlantic	214	191	175	128	167	148	195	101	163	121
East South Central	209	193	304	183	155	152	190	132	219	137
West South Central	108	33	148	58	184	21	216	33	204	25
Mountain	203	950	274	1,004	115	726	133	986	18	897
Pacific	110	198	153	212	204	201	143	167	130	209
SMALLPOX CASE RATES										
101 cities	25	21	14	22	18	21	24	26	[2] 17	29
New England	0	0	0	0	0	0	0	0	9	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	28	33	15	28	20	30	22	37	16	49
West North Central	68	38	31	34	43	26	64	48	[2] 28	42
South Atlantic	33	18	14	36	21	38	32	36	26	40
East South Central	70	66	15	56	45	56	30	76	60	61
West South Central	28	25	36	33	8	58	60	17	24	29
Mountain	150	9	106	36	159	9	159	45	133	27
Pacific	48	95	31	73	36	91	54	71	38	84

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1928 and 1927, respectively.
[2] Sioux City, Iowa, not included.

Summary of weekly reports from cities, April 22 to May 26, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927
101 cities	4	8	6	10	8	8	6	10	[1] 8	9
New England	5	5	2	2	5	5	7	5	11	9
Middle Atlantic	3	5	4	10	2	5	4	6	6	6
East North Central	2	6	3	7	3	3	2	5	5	7
West North Central	6	4	2	2	8	2	2	6	[1] 4	4
South Atlantic	7	16	18	18	19	9	7	13	7	18
East South Central	5	30	0	15	20	66	20	56	10	30
West South Central	24	12	28	37	16	25	4	45	12	25
Mountain	0	9	0	18	18	9	0	9	0	18
Pacific	0	18	15	3	31	10	23	10	36	8

INFLUENZA DEATH RATES

95 cities	32	18	32	13	33	13	29	12	25	9
New England	14	7	21	5	16	14	41	14	18	9
Middle Atlantic	34	21	28	15	31	14	28	10	21	8
East North Central	35	10	36	7	48	10	36	12	33	4
West North Central	31	12	58	8	45	4	18	8	12	12
South Atlantic	30	29	21	16	9	25	16	11	11	13
East South Central	37	37	84	43	73	82	63	48	89	27
West South Central	37	47	25	13	37	13	16	25	33	25
Mountain	44	9	35	9	27	9	27	9	53	9
Pacific	17	21	7	21	17	7	10	0	7	3

PNEUMONIA DEATH RATES

95 cities	196	143	206	131	210	123	189	110	176	100
New England	138	184	189	140	257	144	207	100	253	144
Middle Atlantic	246	168	264	166	267	151	218	119	211	116
East North Central	215	128	211	121	232	97	222	104	175	85
West North Central	90	56	128	68	120	70	88	58	84	87
South Atlantic	172	153	184	114	89	128	146	148	119	85
East South Central	178	183	214	149	193	128	240	112	230	64
West South Central	189	123	90	115	164	140	123	106	144	89
Mountain	106	188	159	99	133	54	97	63	124	36
Pacific	125	117	74	79	98	114	105	121	91	100

[1] Sioux City, Iowa, not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1928 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central	12	10	2,683,500	2,634,500	2,566,400	2,518,500
South Atlantic	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central	7	6	1,048,300	1,028,300	1,000,100	980,700
West South Central	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain	9	9	591,100	581,600	591,100	581,600
Pacific	6	4	2,046,400	1,996,400	1,548,900	1,512,100

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended May 19, 1928.—The following report for the week ended May 19, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Egypt.—Suez.
Aden Protectorate.—Aden.
India.—Bassein, Bombay, Rangoon.
Ceylon.—Colombo.
China.—Amoy.

CHOLERA

India.—Bassein, Calcutta, Moulmein.
Siam.—Bangkok.
French Indo-China.—Haiphong, Saigon.

SMALLPOX

Iraq.—Basra.
India.—Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon.
French India.—Pondicherry.
Dutch East Indies.—Belawan-Deli.
China.—Shanghai, Hong Kong.
Japan.—Kobe, Shimonoseki.
Kwantung.—Dairen.

Returns for the week ended May 19 were not received from Vizagapatam or Tuticorin, India.

CANADA

Provinces—Communicable diseases—Week ended May 19, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended May 19, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever				2				2
Influenza	10			8				18
Lethargic encephalitis				1				1
Poliomyelitis							1	1
Smallpox		2		12	1	13	10	38
Typhoid fever		2	16	7				25

Quebec Province—Communicable diseases—Week ended May 26, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended May 26, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	18	Scarlet fever	80
Diphtheria	46	Smallpox	15
German measles	11	Tuberculosis	62
Influenza	7	Typhoid fever	10
Measles	158	Whooping cough	10

DENMARK

Communicable diseases—March, 1928.—During the month of March, 1928, communicable diseases were reported in Denmark as follows:

Disease	Cases	Disease	Cases
Bronchopneumonia	3,362	Paratyphoid fever	5
Cerebrospinal meningitis	8	Pneumonia	691
Chicken pox	62	Poliomyelitis	3
Diphtheria	590	Puerperal fever	21
Erysipelas	257	Scarlet fever	219
Influenza	5,587	Tetanus	1
Jaundice	113	Tuberculosis	272
Lethargic encephalitis	12	Typhoid fever	10
Measles	5,728	Undulant (Malta) fever	[1] 87
Mumps	657	Whooping cough	1,757

[1] Reported from State Serum Institute.

Population: 3,493,000.

PERU

Arequipa—Mortality, March-April, 1928.—Mortality from all causes was reported at Arequipa, Peru, during the months of March and April, 1928, as follows: March, 1928, deaths, 70; April, 1928, deaths, 59. Deaths from certain causes were distributed as follows: Gastroenteritis—March, 17; April, 4; tuberculosis—March, 14; April, 16; typhoid fever—one death each in March and April; typhus fever—one death in April.

SPAIN

Mortality from all causes and from certain diseases—July-September, 1927.—During the three-month period July to September, 1927, inclusive, the total number of deaths occurring in Spain from all causes was as follows: July, 36,596; August, 33,717; September, 29,279. Population, 22,290,162. Deaths from certain diseases were reported as follows:

Deaths, 1927

Disease	July	August	September	Disease	July	August	September
Bronchitis:				Pneumonia	519	484	462
Acute	837	745	722	Puerperal fever	104	114	114
Chronic	492	476	480	Scarlet fever	58	51	50
Cancer	1,355	1,313	1,329	Smallpox	3	8	18
Diarrhea (under 2 years)	8,190	6,869	4,552	Tuberculosis:			
Diphtheria	81	80	118	Meningeal	235	243	156
Heart disease	2,484	2,441	2,233	Pulmonary	2,122	1,969	1,853
Influenza	102	83	102	Other forms	374	366	318
Malaria	95	120	117	Typhoid fever	456	594	561
Measles	357	289	160	Typhus fever	4	2	
Nephritis	873	899	884				

Madrid—Mortality, April, 1928.—During the month of April, 1928, 1,282 deaths were reported at Madrid, Spain, including diphtheria, 5; measles, 36; scarlet fever, 1; tuberculosis, 150; typhoid fever, 3. Population, estimated, 766,552.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C, indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928			April, 1928				May, 1928		
								17	24	31	7	14	21	28	5	12	19
China:																	
Amoy	C	16															
Canton	C	14	12	1					1	1							
	D	14	11	1					1	1							
Foochow	C	P															
Hong Kong	C	P															
Shanghai (settlement and concession)—																	
Foreigners only	C	3															
Including natives	D	7															
Swatow	C	P	P														
	D	P	P														
Tientsin	C	2	P	1													
Dutch East Indies: Java—Batavia	C		28	3													
	D		18	3													
India	C	20,160	23,047	25,139	15,377	12,391	13,236	4,546	5,384	5,856	5,529	7,746					
	D	10,371	12,863	15,026	8,863	6,750	7,282	2,605	2,931	3,182	3,159	4,920					
Bassein	D					1	2		4	25	22	20	6	6	9	9	16
Bombay	C		2			1	1	1	1	1							
	D		2				1	1		1	1						
Calcutta	C	101	199	428	176	203	341	164	190	148	162	163	131				
	D	64	138	281	125	112	241	94	122	114	112	111	97	105	115	126	102
Madras	C	14	13	1	1	2	14		7	1	2	5	5	5			
	D	8	7	2	1	4	18		2	1	1	4	5	4	5	3	
Madras Presidency	C	2,050	3,073	3,702	1,864	4,681	2,961	510	455	243	275						
	D	1,055	1,736	2,104	984	2,660	1,618	280	244	131	157						
Negapatam	C					4											
	D					6	4					1			1		
Rangoon	C	6	2	8	4	6	29	4	7	8	3	5	10				
	D	5	5	6	3	2	18	2	3	6	5	2	7	6	1		
Tuticorin	C	1		8							10	43	45	19	3		
	D	1	37	14				1			8	26	32	10	3		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C, indicates cases; D, deaths, P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14	April, 1928 21	April, 1928 28	May, 1928 5	May, 1928 12	May, 1928 19
India (French):																	
Chandernagor	C		6	10	14	6	5	2	1		4						
	D		6	10	9	1	5	1	1		4						
Karikal	C		1	1	8	32	6					1					
	D		1	1	4	19	5					1					
Pondicherry	C		1	25	11	12	33				1	2	3	2	1		
	D		1	21	12	10	19				1	2	3	2	1		
Indo-China (see also table below):																	
Saigon	C	1			3	4	16	27	13	21	35	50	28	23	15	10	
	D				1	1	8	19	8	12	20	37	17	12	10	7	
Iraq [1]																	
Kwangchow-wan (see table below)																	
Siam	C	18	110	88	110	200	295	53	88	70	80	120	85				
	D	11	76	64	80	139	214	39	67	54	58	84	61				
Bangkok	C	5	4	3	21	101	60	8	12	16	24		30	24	20	17	14
	D	3	2	2	11	66	36	5	5	12	11		13	14	8	6	9
Straits Settlements: Singapore	C		7	5	23	3		1	1					1			
	D		5	4	12	1		1	1					1			
On vessel:																	
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C										P						
S. S. Tabaristan At Basra, Iraq	C	1															

[1] From July 19 to Dec 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths, Diwaniah Liwa, 122 cases, 72 deaths, Diyalah Liwa, 1 case, 1 death; Duliam Liwa, 100 cases, 69 deaths, Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928			March, 1928			April, 1928			May, 1928
							1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Indo-China (French) (see also table above):																
Annam	C	3,179	226	126	18	267	23	36	14	18	18	23	17	11	18	4
Cambodia	C	251	180	85	72	54	38	22	51	33	22	92	43	102	51	34
Cochin-China	C	469	178	100	113	295	178	113	153	208	217	245	277	316	240	140
Laos	C	246	67	10												
Tonkin	C	1,297	1		2	1							1	4	1	9
Kwangchow-Wan	C	16														

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Dec. 18, 1927-Jan. 14, 1928	Jan. 15-Feb. 11, 1928	Feb. 12-Mar. 10, 1928	Week ended— March, 1928			April, 1928				May, 1928				June 2, 1928
								17	24	31	7	14	21	28	5	12	19	26	
Algeria (see also table below):																			
Algiers	C														1				
Oran	C		2																
Arabia: Aden	C				19	178	343	189	148	151	163	108	59	53	13	5	1		
	D				7	104	206	134	135	134	126	97	48	16	16	7	1		
Plague-infected rats						P	P												
Argentina:																			
Bahia Blanca district	C			3															
Buenos Aires [1]	C					2										(1)	6		
	D																3		
Cordoba Province	C	P	P	10	2							5							
Firmat	C			1															
Loreto	C																		3
Quilino	C			3															
Rosario	C			4	5	4	1												
Santiago Province							1												
Suardi	C																		2
Ucacha	C			1															

[1] Six cases of plague reported in Buenos Aires, Argentina, before May 14, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	24	31	April, 1928 7	14	21	28	May, 1928 5	12	19	26	June 2, 1928
Azores: St. Michaels Island	C	3	3	3	2	8	3	1	1		1		2						
	D	1		1	1	4	1	1			1		1						
Brazil:																			
Bahia	C				4	5	8			P	2	1							
	D				4	4	5												
Porto Alegre	C						2												
Rio de Janeiro	C					4	3	2	1										
	D					1	2	2	1										
Plague-infected rats						1													
British East Africa (see also table below):																			
Tanganyiki	C	P	P	P	P	2	3												
	D					2	3					5							
Uganda	C	99	99	67	79	23	13												
	D	88	96	61	64	18	10												
Canary Islands:																			
Arrecife	C																1		
	D																1		
Las Palmas	C	9		3	3	1	1	2		2									
	D			1	1	1	1												
Teneriffe	C						10												
	D						4												
Ceylon: Colombo	C	1		6	7	3	11	3		4					1	1	2		
	D			6	6	2	6	3		2					1	1	1		
Plague-infected rats			3		2	5	6												
China:																			
Hong Kong	C														1				
Tungliao	D	95																	
Dutch East Indies:																			
Balik-Papan	C				1														
	D				1														
Celebes—Makassar	C		6	2	6	5	1												
	D		6	2	5	5	1												
Java	D	779	829	1,017	754	737	454												
Batavia and West Java	C	130	132	154	128	137	103	19	18	17	26	13							
	D	129	132	152	128	135	103	19	18	17	26	13							

Cheribon	C			1															
	D			1															
Plague-infected rats								1		1	1	1	3	2	1	1	1		
East Java and Madura	C	17	10	8	7	7		1	1	2									
	D	17	10	8	7	7		1	1	2									
Pasoeroean Residency	C			P															
Surabaya Residency	C			P						1					1				
	D									1					1				
Surakarta Residency	C		P	P															
Ecuador: Guayaquil (see table below).																			
Egypt:																			
Alexandria	C			12	5	2	1												
	D			7	2	2	1												
Beni-Souef	C													4	8	4	14	34	17
	D													1	2	4	6	8	5
Cairo	C				2														
	D				2														
Maghagha District	C												1						
	D												1						
Menufia	C																	6	5
	D																		2
Minieh Province	C												32	9	7	13	15	36	12
	D												5	4		5	2	9	1
Suez	C				1	4	13		4	7	3		3	2			1	2	
	D				1	2	9		2	3	4		2	2			1		
Plague-infected rats									2										
Tanta	C																1		
	D																1		
Greece:																			
Athens and Piraeus	C	1			3														
	D	1			1														
Mitylene	C	1	3	3															
Patras	C	1	1																
	D	1	1																
Hawaii Territory: Hawaii	D						1												
India	C	3,246	3,600	5,518	7,097	12,652	23,174	7,517	6,077	6,634	5,851	6,690							
	D	1,792	2,065	3,269	4,925	8,521	16,998	6,031	4,724	5,372	4,780	5,911							
Bassein	D	8	4	4	17	8	12	5	5	7	5	4	5	1	3	2	1		
Bombay	C	4			3	14	33	4	16	28	21	17							
	D	3			3	9	33	4	11	25	21	15	14	19	21	17	14		
Calcutta	C				2														
	D					1					2								
Madras Presidency	C	583	470	791	550	452	271	25	19	13	5								
	D	298	282	359	206	256	212	18	16	9	5								
Rangoon	C	11	11	15	17	35	48	5	11	3	11	5	2						
	D	11	11	15	16	30	43	4	9	5	8	5	1	3	5	3			
Indo-China (see also table below):																			
Saigon	C		1																
Iraq:																			
Baghdad	C					4	2	2	2	1		1	4	4	2	4	3	4	2
	D					2	2	2	2	1		1		4	1		1	1	1
Dulaim Liwa	C					1						1							

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	March 24	March 31	April, 1928 7	April 14	April 21	April 28	May, 1928 5	May 12	May 19	May 26	June 2, 1928
Kwangchow-Wan (see table below)																			
Madagascar (see table below)																			
Mauritius (see table below)																			
Nigeria (see also table below):																			
Lagos	C		17	13	10	10	8	2		2	3	2	6	7	2				
	D		17	13	8	11	8	2		2	3	1	7	7	2				
Peru (see table below)																			
Senegal (see table below):																			
Baol	C	95	P	P															
	D	40																	
Cayor	C	176	48																
	D	88	28																
Dakar	C	1																	
Louga	C	8																	
Thies and vicinity	C	1	1							8									
	D									4									
Siam	C	13	1	3	16	20	42	7	8	13	5	6	11	5					
	D	9		2	11	12	30	6	9	10	5	4		5					
Bangkok	C	2			1	2	1			1			3	1					
	D		1		1	2	1			1			2						
Straits Settlements: Singapore	C		1			1	3		1										
	D		1			1	2		1										
Syria (see table below)																			
Tunisia [2]																			
Turkey: Constantinople	C	1		2															
	D	1		1															
Union of South Africa:																			
Cape Province	C		2	2		1													
	D		2	1		1													
Orange Free State	C		1	8		5	5	3	2										
	D		1	6		4	1	3	2										
Union of Soviet Socialist Republics:																			
Chita district	C	1																	
	D	1																	
Northern Caucasus	C	1																	

Venezuela: State of Miranda—Tacata and Cua	C						P												
On vessel:																			
S. S. Cadwallen, at La Plata, from Rosario, Argentina	C				1														
S. S. Aghios Gerasimos, at Vigo, Spain	C		3																

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928
Algeria (see also table above):								
Algiers	C		2					1
Angola	C		3					
British East Africa (see also table above):								
Kenya	C	95	62	26	24	19		
Ecuador: Guayaquil	C	15	18	4	6	10		
	D		5	4	3	1		
Plague-infected rats		34	31	23	31	21		
Indo-China (French) (see also table above)	C	14	10	7		5	9	
Kwangchow-Wan	C					18	17	
Madagascar	C	314	692	427	342	171		
	D	286	605	388	317	159		
Ambositra Province	C	7	25	105	67	30		
	D	7	17	96	66	29		
Antsirabe Province	C	39	109	117	108	56		
	D	38	108	117	108	54		
Madagascar—Continued.								
Itasy Province	C	36	104	33	19	8		
	D	41	94	29	17	3		
Moramanga Province	C	12	96	19	25	12		
	D	12	83	19	24	12		
Tananarive Province	C	211	408	155	123	70		
	D	189	354	129	102	61		
Mauritius	C	1						
Nigeria (see also table above)	C	32	63	16	16			
	D	29	61	16	16			
Peru	C	34	34		41	52		
	D	19	11		14	9		
Callao	D	3	3					
Lima	C		7	6				
	D		3					
Senegal (see also table above)	C			5	17	8	81	14
	D				13	4	40	5
Syria: Beirut	C		2					

PLAGUE RATS ON VESSELS

S. S. *Modemi* at Goteborg, Sweden, from Bahia and Buenos Aires via Cape Verde Islands, Dec. 22, 1927.
S. S. *Gydavore* at Landskrona, Sweden, from Rosario via Canary Islands, Jan. 22, 1928.
S. S. *Dryden* at Liverpool from La Plata River ports, Jan. 20, 1928.

[1] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928: 17	24	31	April, 1928: 7	14	21	28	May, 1928: 5	12	19	26	June 2, 1928
Algeria (see also table below)	C	683	661	170	129	71	72	3				12							
Algiers	C			3	9	15	10		2	2	1		2		2				
Oran	C	11	20	39	29	11	5		2	10		3	1	2	11				
Angola (see table below).																			
Arabia: Aden	C		1	3	1		1												
Brazil (see also table below):																			
Rio de Janeiro	C		1					1											
	D		1					1											
British East Africa (see also table below):																			
Kenya—Mombasa	C								1		1								
Tanganyiki	D	P	P	P	8	5													
British South Africa:																			
Northern Rhodesia	C	164	185	252	236	233	297		54	8	5	26	7	4					
	D	11	64	62	31	23	42		9			1	1	1					
Southern Rhodesia	C		3	2	1	3	7	4	1	2		21	3						
	D						1					10							
Canada:																			
Alberta	C	23	10	10	11	27	10	7	20	7	13	4	2	3	3	13		5	
Calgary	C							1											
Edmonton	C	1	1	8	5	3	13	1	11	1	7	2			1	12	10		
British Columbia—Vancouver	C			4	8	26	10	2	5	6	4	11	6	1	6	4	2		
Manitoba	C	7	19	7	11	1									7				
Winnipeg	C	2	2	2	2	2													
New Brunswick	C				1		1										1		
Nova Scotia:																			
Halifax	C	1																	
Ontario	C	96	264	347	212	243	147	19	35	20	9	6	18	18	8	15			
Hamilton	C			2															
Kingston	C		1		1	1						2		1					
Ottawa	C	67	134	63	60	68	22	6	8	10	2		3	1		4	2		
Toronto	C	10	34	39	28	20	14	2	3	3	1	2	4	4	1	2	7		
Windsor	C	9																	
Quebec	C	8	25	16	44	26	42	22	40	35	15	20	25	4	33	13	25	15	
Montreal	C		1		8	8	9	6	3				6	2	1				
Quebec	C			4	5	5	11	3	4	4	5	4			9	6	17		

Riviere du Loup	C		3																
Sherbrooke	C									3									
Saskatchewan	C	31	34	58	52	97	22	14	7		12	2	23	15	12	12			
Moose Jaw	C	3		1	4	11	13	2	5			3					1		
Regina	C	5	1	1						1	2	3	2		[illegible]	1			
Saskatoon	C			2	4	15	2												
Ceylon: Colombo	C		1	2		4	6				1								
	D			1		1			1										
China:																			
Amoy	C						1	1	2	1	2	3	2	1		1			
Antung	C				1								1		2				
Canton	C						2	3	2		2	1				1		1	
Chefoo	C	P		P				P											
	D						1												
Foochow	C	P	P	P	P	P	P				P	P	P	P	P				
Hong Kong	C				1	2	7	5	7	10	10	4	4	9	8	8	10		
	D				1	2	4		2	5	12	7	2	10	7	11	5		
Manchuria—																			
Changchun	C			1		4						2		1	1	3			
Dairen	C	1	2	1	5	15	13	1	3	5	6	7	3	6		12	10		
	D	1				8	7		3	5									
Fushun	C		1																
Harbin	C			2	1	5	7	2	3		2	2	3	2					
Mukden	C	2	1			4	21			1			3	1					
Pensihu	C	1																	
Shanghai—																			
Foreigners only	C					5	6	1	1	3	2		1	1	1				
Including natives	D					11	19	2	1	3	3	3	1	3	2	1	7		
Tientsin	C	13	8	9	8	48	20	4	3	3	3	9	1						
Chosen (see table below)																			
Curacao (alastrim)	C					2	3												
Dominican Republic: Santo Domingo	C							2						1					
Dutch East Indies:																			
Borneo—																			
Pontianak	C						1												
Samarinda district	C		P																
Java—																			
Batavia and West Java	C	4	25			4	2	4			1	1							
	D		15																
East Java and Madura	C	8	9	9	5	2	9												
	D	1					1												
Sumatra—Medan	C			3	9	23	14	6			1	2							
	D			2	3	11	2	4			1	2							
	D	1		1							33	6							
Ecuador (see table below)																			
Egypt	C			4	4	1	2				52	11							
	D	1		1							33	6							
Cairo	C			2		1													
France (see table below)																			
Gold Coast (see table below)																			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	24	31	April, 1928 7	14	21	28	May, 1928 5	12	19	26	June 2, 1928
Great Britain:																			
England and Wales	C	473	902	1,041	1,175	1,530	1,473	359	342	322	318	321	326	376	321		336		
Birmingham	C	1				44	3	1				1							
Bradford	C		11	19	32	24	12	9		5	5	3	2	7	2	2	7		
Bristol	C	6	4	8		3	4		2	8	2	1	10	1	5	4	1		
Cardiff	C		1		1					5				1	2		1		
Castleford	C						4	2	16	7	11	27	11	20	11		6		
Leeds	C	7	5	16	11	3	9	3	5	3	3	2	2	1	1				
Liverpool	C				1		1												
London	C					4	14	10	5	1	1	7	5	3	27		10		
Manchester	C	3	6	25	5	25	8	4	3	3	4	2	4	2		1	1		
Newcastle on Tyne	C	6	9	55	22	27	12	3	4		2			4		1	6		
Nottingham	C				13	27	11	5	1	6	1	4	4	6	3		10		
Sheffield	C	10	6	9	14	8	6				1		10	2	2	2			
Stoke on Trent	C				4	1	15	11			1	4	10	5	13	9	8		
Greece (see table below)																			
India	C	3,153	4,052	6,731	10,676	17,777	18,850	6,004	6,169	8,101	7,760	8,789							
	D	715	927	1,650	2,429	3,709	3,826	1,212	1,207	1,500	1,621	1,988							
Bassein	C					1									1				
Bombay	C	10	4	9	14	61	149	49	58	62	49	56	57	54	33	46	37		
	D	2	3	2		24	73	24	33	36	27	32	34	27	25	25	22		
Calcutta	C	5	5	25	36	58	71	20	29	45	40	49	51	31	40	41	29		
	D	6	2	11	27	34	50	15	21	33	35	32	42	21	35	30	26		
Karachi	C						1	1											
	D						1												
Madras	C	8	7	11	21	74	100	30	27	45	81	49	38	60	24	17	22		
	D		2	3	6	8	19	5	3	6	15	16	8	7	7	5	5		
Negapatam	C				5	8	3					1		5	1	3	4		
	D				3	3						1		2			1		
Rangoon	C	17	6	14	136	275	377	96	82	92	50	62	45	37	23	15	2		
	D	3	1	4	31	64	104	28	17	34	23	24	17	12	16	4	2		
Vizagapatam	C				3	10	2			3			2						
	D					8													

India (French):																			
Karikal	C	2	P																
	D	2																	
Pondicherry	C	38	42	41	65	47	9		6	5	7	12		15	9	16			
	D	38	42	41	50	47	9		6	5	7	12		15	9	16			
Indo-China (see also table below):																			
Saigon	C			1	3		3												
Iraq:																			
Baghdad	C	7	5	25	23	19	7	3	1		1	1	3		1	6			
	D	4	4	14	12	11	4	3	1			1	1		1	1			
Basra	C	2	3	4	2	1	7	4	1					1			1		
	D	2	1	3	1			1	1					1			1		
Italy:																			
Leghorn	C						1	1											
Palermo	C									3	2	1	3	3					
Rome and vicinity	C					3													
Jamaica (outside Kingston) (alastrim)	C	9	7	3	2	5	10	3	2	1	7		1	2	1				
Kingston (alastrim)	C	2																	
Japan:																			
Kobe	C																6		
Tokyo	C					4	4	1	3	1	10	8							
	D					1	2				1	1							
Tokyo Prefecture	C								17	5	2	1							
	D										1	1	1						
Yokohama	C													1					
Latvia (see table below)																			
Mauretania	C						P												
Mexico (see also table below):																			
Acapulco	C		1																
	D		1																
Chihuahua	D				1														
Jalisco (State)	C						P	P	P	P	P	P	P	P					
Guadalajara	D			2			1				2	2	1	4	5	7	4		
Manzanillo	D				1			1											
Mazatlan	D																2		
Mexico City and surrounding territory	C			4		2	2							1		1			
Saltillo	D															1	1		
Tampico	C						1												
Torreon	D	2																	
Morocco (see table below)																			
Nigeria (see also table below):																			
Lagos	C										1								
Southern Provinces	C						7		40	26	27								
	D								28	1	6								
Palestine: Jerusalem	C			1		1													
	D					1													
Persia (see table below).																			
Poland	C			1	6	3	1	1					5	2					
	D												1						
Portugal (see also table below):																			
Lisbon	C	8	4	10	12	12	20			2	3		3	2	1				
	D			1			1												
Oporto	C													1					

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14	April, 1928 21	April, 1928 28	May, 1928 5	May, 1928 12	May, 1928 19	May, 1928 26	June 2, 1928
Senegal (see also table below):																			
Dakar	C						34	17			12	5	11			12			
	D							12			8		8			4			
Siam	C	6	1	9	23	35	12		2	14	12	1							
	D			1	2	4	3												
Bangkok	C		1	1	3														
	D				1														
Spain (see also table below):																			
Malaga	D		1	1															
Seville	C				1														
Valencia	C	1			2		1		1	1									
Straits Settlements: Singapore	C		1			1	1	1					1						
Sudan (Anglo-Egyptian)	C				4	85	109	10	28	250	54	29	18		35	39	7		
	D				4	48	27	7	8	75	10	6	8		14	4	1		
Sudan (French) (see table below).																			
Switzerland	C				2														
Syria (see table below).																			
Tunisia: Tunis	C				4	3	14	1		1	2		4		2				
Union of South Africa:																			
Cape Province	C	P				P													
Natal	C					P	P	P	P	P									
Orange Free State	C		P	P	P	P				P									
Transvaal	C	P	7																
Union of Soviet Socialist Republics (see table below).																			
Upper Volta	C						5		2			P				5			
Venezuela:																			
Maracaibo	D	1				1	1												
On vessel:																			
S. S. Arendskerk at Singapore, from Amoy, China	C									P									
S. S. Kashgar at Kobe, from Shanghai	C														P				
S. S. Tjileboet at Hong Kong, from Shanghai	C														P				
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C										1								

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928			March, 1928			April, 1928			May, 1928
									1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Algeria (see also table above)	C	376	459	382	682													
Oran	C	14	10	16	11													
Indo-China (French) (see also table above)	C	19	3	21	25	38	34	58	50	31	90	57	71	69		35		36
Senegal (see also table above)	C															51		
	D															7		
Sudan (French)	C							4		5	1	P.	5			4		30
	D																	6
Syria:																		
Aleppo	C						1	1										
Beirut	C						2	15	11	26		12	7	4	3	5	1	2
	D													2	1			
Damascus	C		3	5	22	13	12	13					1					

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Angola	C	51	151	10	36		
	D		2				
Congo	C	5	77		36		
Cuanza-Norte	C	1					
Cuanza-Sul	C		9	10			
Loanda	C	1					
Zaire	C	3	5				
Brazil (see also table above):							
Porto Alegre	C	11	5		1		
British East Africa (see also table above):							
Zanzibar	C		2				
	D		1				
Chosen	C	21	4	4	21	23	
	D	6	1	2	8	6	
Seoul	C					1	
Ecuador: Guayaquil	C	4	6	2	9		
	D						
France	C	37	25	11	10	13	
Gold Coast	C	7	4		1	3	
Greece	C	10	9	6	11	19	
	D				2	2	
Latvia	C		2		1		
Mexico (see also table above)	D	221	346	256			
Morocco	C	180	622	55	47	30	19
Nigeria (see also table above)	C	820	316	275	217		
	D	173	81	39	45		
Persia	D		2	7			
Portugal (see also table above)	C			143	215		
	D			22	8		
Spain (see also table above):							
Madrid	D		1				
U. S. S. R.:							
Railways, etc	C	25	33	18			
Other territories in Europe	C	366	1,256				
Transcaucasus, Siberia, and Central Asia	C	80	81				
Ukraine	C	27	48	6			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan 15–Feb. 11, 1928	Feb 12–Mar 10, 1928	Week ended— March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14	April, 1928 21	April, 1928 28	May, 1928 5	May, 1928 12	May, 1928 19	May, 1928 26
Algeria (see also table below):																				
Algiers	C							1	3	1	1	2	5	1	3					
	D								1						2					
Oran	C						4	2	10	1		2	1	1	6	2	2	1		
	D														1					
Austria: Vienna	C							1												
Bulgaria (see also table below):																				
Sofia	C			17	6	1	6	1		3		3	14				1	1		
	D				1															
Chile:																				
Antofagasta	D			1																
Talcahuano	D		1								1									
Valparaiso	C		1		1	2	1		1											
	D	2	1		2															
China (see also table below):																				
Manchuria—																				
Dairen	C													7		3				
Harbin	C	2			1										1	1				
Tientsin	C		2																	
Chosen (see table below)																				
Czechoslovakia (see table below)																				
Egypt	C	2		12	4	14	8	9	17		1	1		2	1					
	D	3		5		8	4	2	8		1									
Cairo	C					3							2	3						
	D					3							1	3						
Port Said	C			1		1														
Behera Province	C												29	23						
	D													4						
Gharbieh Province	C												23	5						
Keneh Province	C												5	29						
	D													1						
Greece (see table below)																				
Ireland (Irish Free State) [1]	C							1						1						
Cork County	C					3	1													
Donegal County, Letterkenny	C			4																
Japan (see table below)																				

Latvia (see table below)																				
Lithuania (see table below)																				
Mexico (see also table below):																				
Guadalajara	D					1														
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	15	5	8	6	6			4		4				
	D				2	1	5		4		3					1				
Monterey	D										1									
Morocco (see also table below)	C						342	1,051	316	172	167	219	190	186	167	136	102	62		
Palestine	C	11	1	5	3	9	8	5	10	5			2	3		1	2	2	1	1
Peru (see table below)																				
Poland	C	50	35	19	64	93	195	346	265	90	90	125	77	93		71				
	D	6	2	4	11	10	16	19	26	5	6	7	7	8		2				
Portugal (see also table below): Oporto	C	1			1			1												
Rumania	C	36	16	17	22	35	68	39	68	29	34	33	45	36	38	30				
	D	1		2			3	9	5	2	2	3	4		6	5				
Syria (see also table below): Aleppo	C		2				2													
Tunisia	C	14		3	1	1	6	4	1	13		5			2	16	1	3		
Union of South Africa:																				
Cape Province	C	P	P	P	P	P	1	1	P		P	P	P	P						
Natal	C	P	P	P	P	2	3	1	2	P	P	P		P						
Orange Free State	C			P		P		P			P	P								
Transvaal	C	1		5	P	P					P	P								
Union of Soviet Socialist Republics (see table below)																				
Yugoslavia (see table below)																				
On vessel: S. S. Gaika at Durban, Natal, from Mauritius	C								1											

Place		1927				November, 1927			December, 1927			January, 1928			February, 1928		
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29
Algeria (see also table above)	C	67	33	10	12												
	D	13			1												
Algiers	C	2	2	6	2												
Bulgaria (see also table above)	C	12	24	7	2						2	7	6		8	12	6
	D		1	2	1						1		1		1	2	2
Morocco (see also table above)	C	148	76	7	11	5	14	7	5	6	75						

[1] 4 cases of typhus fever reported June 5, 1928, from Irish Free State.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
China (see also table above):							
Shanghai	D		1				
Chosen	C	90	80	183	400	313	
	D	8	6	19	44	25	
Chemulpo	C	3		1		1	
Gensan	C	2		1			
	D			1			
Seoul	C	5	2			10	
	D	1	1			1	
Czechoslovakia	C	12	7			25	
Greece: Athens	C	3	1	2	2		13
	D						2
Japan	C	1	1				
Latvia	C	6			1	26	
Lithuania	C	69	54	86	137		
	D	14	3	10	12		

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Mexico (see also table above)	D	64	98	46			
Peru:							
Arequipa	D	3	3	2			1
La Oroya	C			P	P	P	
Lima	C	8					
Turkey	C				17		
	D				1		
Union of Soviet Socialist Republics:							
Railways, etc	C	77	102	41			
Transcaucasus, Siberia, and Central Asia	C	208	190	7			
Ukraine	C	295	631	533			
Other territories in Europe	C	1,839	1,924				
Yugoslavia	C	20	2	7	24	3	10
	D	5		3			1

YELLOW FEVER

[C, indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Week ended— Nov. 26, 1927	December, 1927 3	10	17	24	31	January, 1928 7	14	21	28	February, 1928 4	11	18	25
Belgian Congo:																				
Boma	C											3								
	D											2								
Matadi	C											6	12	11	1	5	8			1
	D											2	6	8	2	5	6			

Brazil:																				
Estancia [1]																				
Rio de Janeiro [1]	C																			
Dahomey:																				
Grand Popo	C						1													
	D						1													
Porto Novo	C	1																		
	D	1																		
Gold Coast (see also table below):																				
Ashanti—																				
Obuasi	C		1																	
	D		1																	
Ivory Coast	C	1									1									
	D	1									1									
Liberia: Monrovia	C			1																
Nigeria	C			2																
	D			2																
Senegal	C	3	10	21	31	38														
	D	3	9	21	31	28														
Dakar	C	1			12	14	2	1	4			1	1							
	D				7	10	2	1	4			1	1							
Togoland	C		1																	
	D		1																	

Place		July	August	September	October	November	December	January	February	March	April	May
Gold Coast (see also table above)	C	15	2	6	1							([2])
	D	4	2	4	1							

[1] A case of yellow fever was reported near Estancia, State of Sergipe, Brazil, Mar. 4, 1928; also 2 deaths from yellow fever and 2 suspected cases at Rio de Janeiro were reported on June 4, which were said to be imported from the North.

[2] 1 case of yellow fever at Accra, Gold Coast; probably laboratory infection, reported May 18, 1928.

TREASURY DEPARTMENT

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SPECIAL ARTICLE

An Analysis of the Occupational Mortality Among Males in England and Wales During the Period 1921-1923

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

ASST. SURG. GEN. R. C. WILLIAMS, *Chief of Division*

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PUBLIC HEALTH REPORTS

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OCCUPATIONAL MORTALITY AMONG MALES IN ENGLAND AND WALES, 1921-1923

A Summary of the Report of the Registrar General

By ROLLO H. BRITTEN, *Associate Statistician, Office of Industrial Hygiene, United States Public Health Service*

Because of the fact that the recently issued report on occupational mortality among males in England and Wales[1] will not be generally available in this country, a summary of this report has been prepared. It is, of course, not possible to present the material in any detail, and research workers in the field of industrial hygiene will desire to study the original volume, because of its great significance. At the same time, the outstanding features are of sufficient general interest to warrant a discussion of them. No attempt at a thorough analysis or digest has been made, both because the delay would detract from the timeliness of this paper, and because a really adequate study must be made by persons closely familiar with occupational health conditions in England.

Since death rates by occupation for the general population have not been available in the United States in recent years, the English data prove particularly valuable to us in a field in which we have no comparable material. In many particulars, the occupational mortality rates in England are not generally applicable here, but they are exceptionally suggestive. In a way they mean more to us than corresponding rates for the United States could mean, because in England the worker is more likely to remain in a specific occupation throughout his life, and thus his death may be more properly ascribable to the occupation given on the death certificate.

The current English report departs radically from preceding volumes—so much so that it must be accepted forthwith that few comparisons with the previous material are legitimate. The primary cause of this was the adoption by the English Census Bureau of a revised occupational classification in 1921. An attempt is now made to distinguish occupations on purely occupational lines. For instance, cutlery grinders are now given by themselves. An excess mortality from all causes of 230 per cent is found for them, whereas in the previous report they were combined with all others concerned in the manufacture of cutlery, showing an excess of only 63 per cent.

[1] Registrar General's Decennial Supplement, England and Wales, 1921, Part II, Occupational Mortality, Fertility, and Infant Mortality. London: 1927.

In view of the changes in the census classification, no attempt was made in the present registrar general's report to keep the data comparable in other particulars with preceding reports. Among the changes that should be mentioned are the following: The comparative mortality figures are now calculated so as to yield 1,000 deaths at the death rates for different ages, from 20 to 65 years, prevailing among all occupied and retired civilian males in 1921–1923 for the same ages. In 1910–1912 these figures were based on all males; for 1900–1902, ages 25–65. In this paper, as a matter of simplicity, the comparative mortality figures themselves have not been used,[3] except in one or two tables, but it must still be kept in mind that the standardized rates are for ages 20–65 instead of 25–65, and refer to all occupied and retired males, instead of all males. A rearrangement of occupations by social class was made, there being now five such classes (I, upper and middle; II, intermediate between upper and middle and skilled labor; III, skilled labor; IV, intermediate between skilled and unskilled labor; V, unskilled labor). The years 1921–1923 have been used instead of 1920–1922 (which would have been consistent with previous reports). It was felt that industrial conditions were still abnormal in 1920 as a result of gradual demobilization following the war, and, furthermore, the new census classification as to occupation and the 1920 international list of causes of death could not have been used for the year 1920.

It should be noted that in the present volume retired have been included with the occupied, since they were formerly employed in the occupation with which they are grouped. Also the tables are limited to civilians. As a matter of brevity, the term "all occupied" in this paper has frequently been substituted for "all occupied and retired civilian males."

First, a summary of what is contained in the British report is desirable, since only certain phases of it can be covered in this paper. After a discussion of the mortality by social class, the important causes of death are considered, with tables giving the occupations with the highest and lowest comparative mortality figures for each disease. Then the opposite point of view is taken and each important occupation is discussed seriatim. The next section deals with occupational fertility—i. e., the number of births to men in each occupation for the year 1921. These data were previously carried in the general report of the registrar general. A further section discusses infant mortality, treated in the same way. Many of the detailed tables also take up occupational fertility and infant mortality, but only brief reference will be made to this material in the present review. Then follows a series of tables dealing with the various

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[3] The standardized rates used were obtained by multiplying the "comparative mortality figures" by a factor, the rate for all causes among all occupied and retired males.

phases of the material, including registered and calculated deaths from all causes according to the detailed occupations employed by the census bureau; mortality for all causes in various ages by the abbreviated occupational classification used generally in the volume, expressed as a ratio to all occupied and retired; comparative mortality figures by occupation and causes, both where the rate for all causes is taken as 1,000 and where the rate for each cause is taken as 1,000; various ranking tables according to occupation; mortality at various ages by cause and social class, expressed as a ratio to all occupied and retired; and finally a detailed set of "abstracts" giving the number of deaths and the specific death rates by age, cause, and occupation. One can hardly fail to realize from this brief summary the great value which the report possesses and the more elaborate treatment of the material than in previous reports.

The present paper is divided into six parts, for convenience:

I. Social distribution of mortality.

II. A comparison for all occupied males with 1910–1912.

III. Industrial comparisons for mortality, fertility, and infant mortality.

IV. Specific occupational comparisons according to major causes of death.

V. Summary of standardized rates by occupation.

VI. Mortality by age from a few causes in larger occupations.

In interpreting occupational mortality, one must be forewarned as to possible fallacies. Perhaps this can most readily be done by quotation from the bulletin itself:

It can not be assumed that the deaths tabulated for any occupation have occurred exclusively amongst the men tabulated to that occupation. So far as this is the result of ordinary changes of occupation by men in normal health, as from agricultural laborer to policeman or farm bailiff, the returns are probably not prejudiced, * * * for as such changes of occupation are always going on the census figure may be regarded, at all events in normal times, as representing an unprejudiced and typical sample of the occupational population during the period supplying the deaths, and with which they may therefore be fairly compared, even if they are not individuals actually included in the census occupational population in question * * *.

But a more important source of discrepancy between the census and registration figures collated in the tables is probably to be found, not in economic, but in health considerations. The reader must be reminded, as in previous reports of this series, that the weakly puddler or blacksmith may be forced to adopt a less strenuous occupation before his death. If so the occupation at death (the last occupation before work ceased) may differ from that at census if change of occupation has occurred shortly after the census, and death shortly after the change * * *. But even when the death corresponds with the occupational return at census the same fallacy may apply in only slightly less degree. For the former puddler may be obliged by bronchitis, skin cancer, or other chronic disease incidental to his calling to become a costermonger for years before his death, in which case the deaths correspond with the census return, although

really pertaining by origin to another occupation. The only difference in this case is the transfer of one life from puddlers to costermongers in correspondence with the death, but at most ages this goes a very short way toward compensating for the death transfer. This type of error must evidently tend toward understatement in some degree of the mortality of strenuous occupations, and corresponding overstatement of those open to men of impaired physique, but no measure of the extent of this tendency can be applied * * *.

Besides these general instances there are doubtless many others applying particularly to certain occupations, but under our present system of national records no means of avoiding this difficulty has ever suggested itself * * *.[3]

There are two additional sources of error which require specific mention. For one thing, there is a tendency for the classification of occupations to become yearly more specific so far as the census returns are concerned, and it is probable that the same minuteness does not always apply to the occupation as recorded by the physician on the death certificate. Hence, for certain specific occupations the population may be too great to correspond with the mortality, giving unreasonably low rates. This perhaps explains why the mortality from all causes for farmers' sons and other relatives assisting in the work of the farm is only 22 per cent of that for all occupied (when age has been taken into account), while the rate for farmers is 71. Many other examples could be cited.

A second source of error seems to us to be of very great significance. In a sense it is covered by the comment above as to the transfer of a puddler to the occupation of costermonger by reason of some disease incident to his former occupation. But the effect is too vast to be explained purely on the basis of diseases incident to strenuous occupations. There is in industry a general tendency for the stronger bodied to go into the more strenuous occupations, and for the weaker to seek the less strenuous. The high mortality among costermongers can not be explained, it seems to the writer, on the basis of deaths associated with some prior occupation which these men had. In general it appears to be the result of a selective process of such subtle and sweeping effect that occupational mortality figures must always be judged with this factor in mind. Drivers of horse-drawn vehicles have extraordinarily high mortality rates from nearly every cause. They must have been on the average more or less inferior physically throughout their lives. They may never have been employed in any very active occupation. In many occupations this selective factor seems to have been at work, and when it is combined also with complications due to varying rates by social class or economic conditions, we are faced with difficult problems indeed.

A final caution as to interpreting mortality records in general. All studies of autopsy material indicate that the correct cause of death is

[3] At another point of the bulletin reference is made to the fact that as life advances there is a tendency to omit the occupation on the census return, whereas it would appear on the death certificate. This is very important and tends to increase the mortality rates of the advanced ages, but has not been considered here, because it has been felt safer to omit mortality rates for the advanced ages.

by no means always placed upon the certificate. Understatement of syphilis and some other causes is to be expected from obvious reasons; but the difficulty is of much wider scope, involving many causes of death, and of varying effect in the different social classes and in particular occupations. It is no doubt also responsible for more or less correlation between causes of death, because of a confusion in the record. There is, moreover, the obstacle of deaths due to more than one disease entity. All rates must be scrutinized for errors of this character before conclusions are drawn, and conclusions must always be accepted with reservation.

Since this review of the British mortality was undertaken particularly to be of use to the industrial hygienist in the United States, international difference in certifying causes of death becomes a point which can not be disregarded. The high mortality rates for chronic bronchitis in these tables may surprise a reader who is not familiar with such differences. As a matter of fact, the death rates for chronic bronchitis in this country are usually about one-fourth of those in England and Wales. In regard to this point, Newsholme [4] states:

> The contrast * * * between death rates in England and in the United States shows a great unexplained excess of mortality from bronchitis in England. * * * In the United States the certification of chronic bronchitis is discouraged: Thus in New York medical certificates stating chronic bronchitis as the cause of death are sent back for revision.

It should be added that if the two causes of death are given on the same death certificate, one must be lost sight of in the compiled figures. In the United States this is handled according to a series of rules in the Census Bureau; in England the opinion of the physician is usually followed. This may in part explain the difference in the mortality rates from bronchitis.

With regard to other points of incomparability, it may be stated that in the United States cerebral hemorrhage is favored over arterial disease, while in England it is treated as secondary to and therefore a complication of arterial disease. Quoting further from Newsholme:

> Arteriosclerosis is not provided with a separate column in the American statistics; in England it appears to be superseding cerebral hemorrhage as a cause of death. Renal disease is a common cause of cerebral hemorrhage, and the fact that deaths under this heading are seven times, while deaths under cerebral hemorrhage are only two and one-half times, as many in the United States as in England, points to considerable incomparability in the data.

I. Social Distribution of Mortality

The mortality in different occupations is affected in a marked manner by the social status of the workers, involving, as this does, economic differences and environmental distinctions outside the factory. The registrar general has recognized this fact by classifying the oc-

[4] Elements of Vital Statistics. Sir Arthur Newsholme. 1923.

cupations according to social class. Inaccurate as such a classification necessarily is, considerable interest attaches to the mortality rates in the several social classes, especially in their bearing on the rates in specific occupations. Some effect of occupational hazards, direct and indirect, on the rates for each social class must be allowed for, but the extent of this effect is indeterminate.

First are presented the standardized mortality rates, by social class, for the ages 20–65 according to cause of death. The standardized rate is used in preference to a crude rate, since it affords a convenient average which more or less eliminates differences due to variations in the age distributions of the populations involved. The social classification seems clear without further comment, beyond noting that the allocation into the social class was done by specific occupation, not by individuals.[5] The diseases are arranged in an order based on the tendencies of the rates to vary from class to class, at the top being those in which the rates are highest in social classes IV and V.

TABLE 1.—*Standardized mortality of the five social classes, from all causes and from certain causes, at ages 20 to 65 years, 1921–1923*

Cause	Death rate per 100,000				
	Class I, upper and middle	Class II, intermediate	Class III, skilled labor	Class IV, intermediate	Class V, unskilled labor
Bronchitis	11.6	24.9	42.5	54.3	80.0
Old age	.5	.8	1.4	1.3	3.0
Respiratory tuberculosis	73.2	126.3	146.2	150.2	209.5
Hernia	1.7	2.3	2.8	3.7	4.1
Valvular heart disease	33.0	52.3	55.9	61.6	74.0
Chronic rheumatism, etc	1.9	2.7	3.2	3.0	3.6
Ulcer, stomach	6.7	8.1	9.3	10.1	12.2
Pneumonia	64.5	65.5	69.7	83.4	116.9
Other tuberculosis	9.2	12.4	12.4	12.4	13.5
Syphilis, etc	18.0	22.6	23.9	23.8	34.7
Other respiratory	10.9	13.9	13.5	15.0	18.4
Cancer	93.8	108.1	116.3	113.3	144.4
Influenza	27.8	31.2	31.1	37.4	39.3
Other nervous	23.8	27.8	27.2	28.5	36.9
Accident	36.5	31.6	42.8	58.4	54.2
Acute nephritis	2.7	4.4	4.1	3.6	4.4
Cerebral hemorrhage	36.3	42.3	40.9	38.7	44.4
All causes	743.0	862.0	870.0	921.0	1,151.0
Chronic interstitial pneumonia [1]	1.0	.9	1.6	1.2	1.1
Other genito-urinary	7.5	7.1	6.9	8.1	10.4
Chronic nephritis	31.4	35.6	30.6	28.7	33.6
Other heart	63.8	65.5	54.0	55.3	69.2
Other causes	49.4	44.7	43.9	42.0	44.8
Intestinal obstruction	5.9	5.0	4.0	4.9	5.7
Ulcer, duodenum	6.4	5.9	4.7	5.1	6.0
Suicide	25.7	28.4	20.1	19.8	21.7
Other digestive	20.6	17.5	14.5	14.0	17.1
Alcoholism	1.1	2.7	.5	7	.7
Arteriosclerosis	29.2	20.4	17.5	15.9	21.5
Diseases of prostate	3.7	4.0	3.5	2.7	2.9
Other circulatory	3.6	2.8	2.2	2.6	2.3
Diabetes	13.9	16.2	10.2	8.4	7.4
Diseases of liver	14.3	16.4	5.8	6.5	7.6
Appendicitis	13.8	11.6	7.2	6.9	5.7

[1] Fibroid phthisis, fibrosis of the lungs, silicosis, miners' phthisis, etc.

[5] The social classes VI, VII, and VIII of the previous report have been combined with one or another of the five classes now used.

The table runs the gamut from bronchitis, with a rate of 11.6 in class I and 80 in class V, to appendicitis, where the figures are 13.8 and 5.7, respectively. One must remember that in some cases the distinctions are artificial, due to differences in diagnosis in the various social classes and to other factors. This influence is shown vividly by the rates for "old age," the rate for class V being six times as high as that for class I, due to more precise statement of the cause of death among the better classes at these advanced ages.

As would be necessary, those diseases which one thinks of as being more or less industrial in origin appear at the top of the table, having higher rates in the social classes most acutely affected by the strain and specific hazards of industry.

Taken roughly, the table suggests that deaths from respiratory conditions are strikingly greater in the lower social levels. The greatest difference lies in bronchitis, but respiratory tuberculosis, pneumonia, influenza, and "other" respiratory diseases all are correlated similarly with social class. Of valvular heart disease this is also true, but not of circulatory diseases in general. The marked difference in hernia is rather surprising. Digestive diseases (except ulcer), diabetes, diseases of the liver, etc., are higher among the better classes, the difference apparently being related to "financial capacity for overindulgence in dietic indiscretions," as Doctor Collis states in his review of the registrar general's report.[6]

Summary of the rates in this table by certain groups of diseases ((*a*) all tuberculosis; (*b*) pneumonia and bronchitis; (*c*) circulatory; (*d*) digestive) shows some striking differences according to social class. In class I the highest rate for any of these four is that of the circulatory disease group, with digestive diseases second, while classes III and V have all tuberculosis for their highest rates, with circulatory second for class III and pneumonia-bronchitis second for class V.

The data relating to cancer have received careful and detailed consideration in the registrar general's report. Possibly sufficient reference will be to quote a paragraph from Doctor Collis's review:[7]

> Apart from cancer of the skin with its definite occupational causation, cancer of the lip, tongue, jaw, esophagus, and stomach as far as the pylorus is found, for each site named and in the order stated, to increase in prevalence from class I to class V; but, when the pylorus is passed, cancer is found attacking the remainder of the digestive tract, and indeed other organs as well, quite indiscriminately when distributed according to social class. Why cancer of the upper alimentary tract displays this remarkable social incidence is not at once obvious.

Mortality from alcoholism needs a more thorough study than can be given to it in this summary; but the presence of alcoholism, digestive diseases, and diseases of the liver at the bottom of the table

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[6] Journal of Industrial Hygiene, May, 1928 (Vol. X, No. 5), p. 140.
[7] Cited previously.

suggests that intemperance is now to a large extent a privilege of the better social classes, who can afford to be intemperate.

These fragmentary comments do not exhaust all of the meaning in this unique table, but other phases must be left to the reader.

It is not possible to devote space to any elaborately drawn picture of the mortality by age in the several social classes. A table of the rates for five of the commonest forms of death showing markedly higher rates among the poorer classes must suffice. These are the causes of death which are of peculiar interest from an occupational standpoint.

TABLE 2.—*Mortality by age for the five social classes, from all causes and from certain causes, 1921–1923*

Cause and social class	Death rate per 100,000, by age group					
	[1] 15–19	20–24	25–34	35–44	45–54	55–64
All causes, all classes	**247**	**352**	**399**	**639**	**1,156**	**2,572**
Class I	142	237	261	484	985	2,247
II	205	307	376	569	1,090	2,469
III	243	347	380	590	1,070	2,508
IV	248	367	420	609	1,173	2,482
V	299	408	498	880	1,507	3,061
Respiratory tuberculosis	**69**	**136**	**133**	**160**	**166**	**150**
Class I	28	50	57	87	86	82
II	62	121	132	137	125	103
III	71	149	129	151	160	156
IV	59	135	132	164	168	147
V	89	158	161	238	256	228
Cancer, all sites	**3**	**6**	**11**	**40**	**166**	**494**
Class I	3	4	10	24	146	386
II	4	6	12	35	150	458
III	3	6	11	40	160	495
IV	3	5	11	40	163	469
V	3	5	13	51	211	596
Bronchitis	**1**	**3**	**6**	**20**	**56**	**191**
Class I	3	------	1	5	17	47
II	[1] 0	2	4	11	31	168
III	1	3	5	16	50	189
IV	1	4	8	26	66	225
V	2	4	10	41	109	313
Pneumonia	**21**	**28**	**40**	**72**	**103**	**170**
Class I	8	16	26	63	93	144
II	16	29	33	62	87	145
III	20	27	37	63	91	153
IV	22	31	45	80	109	174
V	24	41	61	111	154	251
Valvular heart disease	**10**	**16**	**22**	**36**	**72**	**188**
Class I	3	6	7	17	35	135
II	9	14	18	31	63	177
III	11	15	20	34	69	184
IV	9	16	23	40	76	196
V	15	21	32	50	95	217

[1] Less than 0.5.

What is brought out particularly is the fact that the greatest relative difference occurs in middle life when the effect of industrial activity is most felt. For instance, at 35–44 years the cancer death rate for class V is more than twice that for class I, but after 50 years the difference between the two is not marked at all. So with valvular heart diseases, and in lesser degree with bronchitis. The difference

is not so marked in the case of pneumonia. For all causes, the following table brings out this tendency succinctly. First is given the ratio of the death rate in class III to that in class I; then the ratio of that in class V to that in class III.

TABLE 3.—*Ratio of one social class to another by age, all causes*

Class	Age group					
	16-19	20-24	25-34	35-44	45-54	55-64
III to I	171	146	146	122	109	112
V to III	123	118	131	149	141	122

Class I evidently has an exceptionally low rate under 20 years of age, for more or less obvious reasons. Class V shows the greatest differences from class III at 40 years of age, the ratio declining here more slowly than in the comparison between classes III and I.

With this brief comment, the subject of mortality according to social class must be passed over; but its effect on occupational mortality must be kept in mind during the remainder of this paper. The abbreviated occupational groups which form the basis of most of the comparisons frequently involve specific occupations falling into more than one social class, but where possible the factor of social class will be taken into account. The social class will be shown in roman numerals following the name of the occupation. Where any particular group really includes occupations falling into two social classes, the social class with the larger number of persons is shown. Where the group is composed of both skilled and unskilled workers, it is shown in the intermediate class.

II. A Comparison for all Occupied and Retired Males with 1910-1912

The reason why the registrar general has made no particular effort to keep the present report comparable with the preceding has already been discussed. Although certain occupations may be legitimately compared for the two periods, a detailed knowledge of the classification of occupations would be necessary and much caution in interpretation. It has seemed preferable for the present purpose to omit any such comparisons, and to give, as suggestive of the changes which have taken place, simply the rates for the two periods by disease for all occupied and retired males. This comparison is made in Table 4.

TABLE 4.—*Mortality by age among occupied and retired males, 1910–1912, compared with 1921–1923*

	Death rate per 100,000 by age group					
	[2] 15–19	20–24	25–34	35–44	45–54	55–64
All causes:						
1910–1912	220	352	471	794	1,465	3,004
1921–1923	247	352	399	639	1,156	2,572
Respiratory tuberculosis:						
1910–1912	58	132	168	208	230	220
1921–1923	69	136	133	160	166	150
Cancer, all sites:						
1910–1912	3	5	11	43	169	435
1921–1923	3	6	11	40	166	494
Diabetes:						
1910–1912	3	5	6	8	15	44
1921–1923	3	5	6	7	13	32
Alcoholism:						
1910–1912	[1] 0	[1] 0	2	6	8	8
1921–1923			[1] 0	1	2	1
Cerebral hemorrhage:						
1910–1912	1	2	4	17	69	221
1921–1923	1	2	3	11	49	194
Valvular heart:						
1910–1912	9	11	15	34	75	177
1921–1923	10	16	22	36	72	188
Bronchitis:						
1910–1912	1	2	5	18	67	245
1921–1923	1	3	6	20	56	191
Pneumonia:						
1910–1912	17	30	45	79	125	210
1921–1923	21	28	40	72	103	170
Other diseases of respiratory system:						
1910–1912	2	4	6	14	30	67
1921–1923	2	3	5	10	21	41
Hernia:						
1910–1912	[1] 0	1	1	1	4	12
1921–1923	[1] 0	1	1	1	4	11
Cirrhosis of liver:						
1910–1912	[1] 0	[1] 0	2	12	34	57
1921–1923	[1] 0	[1] 0	1	4	15	31
Chronic nephritis:						
1910–1912	3	5	11	27	71	151
1921–1923	3	5	9	17	45	108
Suicide:						
1910–1912	4	9	14	23	35	50
1921–1923	3	7	9	20	34	48
Accident:						
1910–1912	40	44	49	63	80	106
1921–1923	36	36	33	39	53	76

[1] Less than 0.5. [2] In 1921–1923, this group is 16–19.

The marked decline in mortality for all causes (which is found except for ages under 25 years) is disclosed in most causes of death. Notable among the exceptions are valvular heart disease and cancer. It is interesting in the latter case that there is no increase found except at the higher ages, where possibly the effect of improved diagnosis would be most felt. Are we to infer that the British data do not lend much strength to the supposition that cancer mortality is actually on the increase?

Respiratory diseases (tuberculosis and pneumonia) show the most signal improvements. This fact is encouraging; but the data for the present time indicate overwhelmingly the importance of such causes of death in the occupational experience of England. Nor is there reason to believe that respiratory diseases are of any less industrial consequence in the United States.

The decline in cirrhosis of the liver, reflecting with considerable precision the drinking proclivities of a nation, at least with regard to spirituous liquors, is of interest. Chronic nephritis shows a decrease which is of the same order of magnitude.

In connection with the use of cirrhosis of the liver as a possible index of alcoholism, the following quotation is taken from the registrar general's report:

This disease was included in the abstracts as the best available index to alcoholism in occupational mortality tabulation. In former reports of this series two such measures were employed, alcoholism returned as such and cirrhosis of the liver. But conditions have changed. Whereas in 1910–1912 the deaths of 1,339 men aged 20–65 were allocated to alcoholism the corresponding number in 1921–1923 was only 315. As 100 deaths a year in a population of 10,000,000 can form only a very imperfect index to the occupational incidence of alcoholism, reliance for this purpose is now placed entirely on cirrhosis of the liver, to which 2,649 deaths within the same limits of age (20–65) were allocated in the three years. It may, of course, be objected that cirrhosis is not necessarily alcoholic in origin, but evidence of its close association with alcoholism in these returns is discussed on page * * * [see next paragraph]. The mortality comparisons for cirrhosis * * * show that its incidence varies largely in accord with the financial means available for overindulgence.

Publicans form part of a remarkable group of four occupations, all concerned with alcohol, which return the four highest * * * [rates for cirrhosis of the liver, the other occupations being brewers, barmen, and cellar men]. The significance of this fact admits of no doubt, and together with the correspondence between cirrhosis mortality and financial resources (vide infra), it constitutes the evidence of close association of cirrhosis with alcoholism * * *.

III. Industrial Comparisons for Mortality, Fertility, and Infant Mortality

For most of the comparisons as to occupation, the registrar general has used a selected group of 164 occupations which do not include quite all of the occupied males in the country. Out of 9,705,000 occupied and retired workers in England and Wales, aged 20–65, 7,933,000 are included in this selected group. Before taking up this latter group, there seems to be some advantage in considering for a moment the whole industrial population within the age limits of 20 and 65 from the point of view of industry rather than from that of occupation. The volume gives such a table, in which the detailed occupations as listed by the British census are classified into 31 industrial groups. For the present purpose, these industrial groups, with certain important subdivisions, have been chosen.

The table deals only with all causes of death and employs the ratio to all occupied and retired males (based on the standardized rate). As the table also gives the corresponding ratio for births and the infant mortality rate (according to industry and occupation of the father), these figures have been included because of their general industrial interest. With respect to the birth ratio, it may be explained that it is exactly comparable with the death ratio used in

the table, and is thus, so to speak, a "comparative fertility figure."[8] The number of workers in each industry is also supplied.

TABLE 5.—*Industrial mortality, legitimate fertility,[a] and infant mortality* [a]

Class and occupation	Ratio to all occupied and retired males: Deaths (1921–1923)	Ratio to all occupied and retired males: Births (1921)	Infant mortality per 1,000 births (1921)	Number of persons (20–65 years)
All males, occupied and retired	100	101	79	9,704,860
Class I	82	85	38	225,618
Class II	94	85	55	1,974,884
Class III	95	97	77	4,218,715
Class IV	101	109	89	1,984,906
Class V	125	128	97	1,300,737
I. Fishermen	91	130	99	24,485
II. Agricultural occupations	68	107	60	876,400
III. Mining and quarrying occupations:				
1. In coal and shale mines	101	25	103	786,242
2. In metalliferous mines and workings	139	132	98	19,287
3. In other mines and quarries	90	109	84	42,116
IV. Workers in treatment of nonmetalliferous mine and quarry products (exclusive of gas works):				
1. Makers of coke and by-products (exclusive of tar distilling)	72	97	124	8,294
2. Makers of other products	78	104	73	14,128
V. Makers of bricks, pottery, and glass:				
1. Makers of bricks, pottery, and earthenware	126	114	99	49,190
2. Makers of glass and glassware	128	121	86	20,23[illegible]
VI. Workers in chemical processes; makers of paints, etc.:				
1. Workers in chemical processes	89	93	93	31,512
2. Makers of paints, oils (not mineral), etc	90	106	91	20,638
VII. Metal workers (not electroplate or precious metals)	96	98	79	1,229,392
VIII. Workers in precious metals and electroplate	99	91	72	23,482
IX. Electrical apparatus makers and fitters (not elsewhere enumerated), and electricians	85	89	66	112,758
X. Makers of watches, clocks, and scientific instruments	91	74	64	19,261
XI. Workers in skins and leather, and makers of leather and leather substitute goods (not boots or shoes):				
1. Furriers, skinners, tanners, and leather dressers	106	103	78	24,285
2. Makers of leather and leather substitute goods	92	85	62	21,686
XII. Textile workers	105	80	86	274,188
XIII. Makers of textile goods and articles of dress	108	90	70	235,267
XIV. Makers of foods, drinks, and tobacco products:				
1. Makers of foods	88	90	70	120,119
2. Makers of drinks	126	107	81	36,091
3. Makers of tobacco products, cigars, cigarettes, snuff	114	88	65	5,698
XV. Workers in wood and furniture	88	91	70	395,598
XVI. Makers of and workers in paper; printers, bookbinders, photographers, etc	94	84	62	136,926
XVII. Builders, bricklayers, stone and slate workers; contractors	99	119	83	442,446
XVIII. Painters and decorators (not pottery)	111	100	75	177,842
XIX. Workers in other materials:				
1. Workers in rubber, vulcanite, ebonite	91	96	64	15,054
2. Workers in bone, horn, ivory, celluloid, etc	112	81	71	2,420
3. Workers in other materials	109	87	59	9,364
XX. Workers in mixed or undefined materials (not elsewhere enumerated)	94	104	89	80,087
XXI. Persons employed in gas, water, and electricity undertakings (not elsewhere enumerated)	97	108	85	44,564
XXII. Persons employed in transport and communication:				
1. Railway workers	83	94	76	275,258
2. Road transport workers	110	107	83	459,415
3. Water transport workers	158	143	97	247,623
4. Other workers in transport and communication	110	96	75	157,752
XXIII. Commercial, finance, and insurance occupations (exclusive of clerks):				
1. Commercial occupations	103	85	64	813,898
2. Persons employed in finance and insurance	90	73	48	91,920
XXIV. Persons employed in public administration and defense (excluding professional men and typists):				
1. Public-administration	80	81	55	236,801

[a] According to occupational classification of infant's father.

[8] Ratio to the number of births which would have occurred if the fertility rates at the various age groups in the several occupations had borne the same relations to each other as those stated for all married males in the 1921 census, the rates being increased to yield the number of births registered in 1921.

TABLE 5.—*Industrial mortality, legitimate fertility, and infant mortality*—Contd.

Class and occupation	Ratio to all occupied and retired males		Infant mortality per 1,000 births (1921)	Number of persons (20-65 years)
	Deaths (1921-1923)	Births (1921)		
XXV. Professional occupations (excluding clerical staff)	83	80	41	276,164
XXVI. Persons employed in entertainments and sport	121	82	73	57,568
XXVII. Persons engaged in personal service (including institutions, clubs, hotels, etc.)	121	70	80	285,326
XXVIII. Clerks and draftsmen (not civil service or local authority); typists	99	75	51	447,367
XXIX. Warehousemen, storekeepers and packers	97	88	74	179,986
XXX. Stationary engine drivers, dynamo and motor attendants	86	102	90	139,911
XXXI. Other and undefined workers	132	122	91	736,668

This summary will serve chiefly as a background for further tables. One can not single out from it occupations with special hazard to health, but he can get a clear idea as to the fluctuations in industry around the rate for all occupied males. Industries with relatively low rates will not appear in subsequent tables. It is interesting to note that agricultural occupations have a mortality which is 32 per cent below the average. No discussion of the data for fertility and infant mortality by occupation of the father will be undertaken in this survey, but it is of moment to recognize that we find the same correlation with social status in the birth and infant mortality rates (based on the occupation of the father) as was found previously in the case of the death rate from all causes.

IV. Specific Occupational Comparisons According to Major Causes of Death

In studying mortality in relatively small occupational groups, a single summary figure is a prerequisite. What we are looking for are clues to hidden industrial hazards; and at the present stage of knowledge of industrial hygiene and its application, these must be looked for mostly in small groups of workers. The hazards of larger groups have been rather well understood for a long time, because interest of the general public has centered upon them. To obtain a satisfactory age curve for any disease, it appears that approximately 50,000 persons are required in the group—much larger than any group that is likely to contain hidden industrial hazards. Accordingly, this paper will place chief emphasis on the standardized rate—i. e., on an average figure for each occupation which makes allowance for differences in age distribution. These data will be supplemented by such age curves as are suggestive. A study of occupational mortality by age, however, is not so much a research into the hazards of specific occupations as it is into the manner in which industrial life in general reflects itself in the different causes of death.

To industrial hygienists in this country, the tables presented here are very suggestive, because they give actual rates—i. e., the number of deaths in a known population. American occupational mortality

statistics have never successfully been calculated on such a basis. Furthermore, the effect of age has been eliminated by determining what the rates would be if applied to a single age distribution for all of the occupations. This correction is of extreme importance in dealing with this subject, since the groups frequently differ widely as to age.

At the risk of burdening this paper with an excess number of tables, it has been felt almost necessary to give the occupational mortality by disease in successive tables, with a summary at the end in which the rates for different diseases in one occupation can be brought together. (Sec. V.) This method makes it possible to arrange the occupations in the order of the rates, singling out for special attention those which have very excessive rates.

However, it was important not to confuse the reader by including in the tables rates which are not particularly high or which were based on too small numbers to be statistically significant. Accordingly, the only rates included in this series of tables are those which are significantly above the rates for all occupied and retired males. The criterion used was the probable error,[9] and no rates appear where the difference between the rate and that for all occupied and retired males is less than three times the probable error. It was not necessary to calculate the probable error of the difference itself, since the rate for all occupied and retired males is based on a very large population and has no appreciable error from the point of view of simple sampling.

In using such a criterion no inference is possible that these occupations have significantly high rates as a result of the occupation per se. As explained previously, social and environmental conditions not associated with the industry and the question of selection of workers enter into the magnitude of the rates. However, the method does eliminate any occupation having a high rate due purely to small numbers. That this elimination is of considerable importance will be evident to anyone who has dealt with official vital statistics.

An exception to the rule was made in the case of occupations in social class V. So frequently were the rates for this class well above those for all occupied that it seemed well to include only class V occupations where the rates were significantly above those for that class (using three times the probable error as before) instead of above those for all occupied and retired males. None of the diseases specifically considered in this series of tables have lower rates in class V than in the other classes.

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[9] When added to and subtracted from an average or rate, the probable error fixes the limits within which it is an even chance that the true average or rate would be found. In the case of an average it is obtained by multiplying the standard deviation by 0.6745 over the square root of the number of items. In the case of death rates, it is obtained similarly, using the formula for the standard deviation given from simple sampling—i. e., the square root of the product of p and q divided by n, where p is the chance that the death will occur (or the death rate per person), q the difference between this figure and unity, and n the population. Adjustment has been made for the fact that the data cover three years and are therefore more stable than data for a single year.

TUBERCULOSIS

It is fitting that the first disease to be considered is respiratory tuberculosis, which is the industrial disease of greatest importance at the present time in spite of its rapid decrease in the general population. The table follows.[19] It gives also the rank of the occupations, as do the succeeding tables.

TABLE [illegible].—*Standardized mortality from respiratory tuberculosis in occupations with rates above average, males aged 20–65, 1921–1923, in England and Wales*

Occupation group No.	Occupation	Mortality rate (standardized)
13a	Tin and copper mine, underground workers, not superintending staff (III)	1,886.0
13	Tin and copper miners, not superintending staff (III)	1,323.5
40a	Grinders in the cutlery trade (IV)	1,178.5
40	Metal grinders (IV)	636.7
95	Slate masons and slate workers (III)	512.5
18	Potters' mill workers; slip makers; potters (III)	411.4
153	Barmen (IV)	402.5
38	File cutters (III)	365.3
101	Drafters and brush makers (III)	355.5
127	Costermongers, hawkers, and street sellers (V)	342.4
37	Cutlers (III)	336.0
20	Earthenware, china, etc., kiln and oven men (III)	335.6
118	Stevedores (IV)	333.9
41	Metal glazers, polishers, buffers, and moppers (IV)	317.8
30	Brass foundry furnacemen and laborers (IV)	317.6
35	Brass finishers and turners (III)	308.2
160a	Warehousemen, textiles and clothing (III)	306.3
94	Masons, stone cutters and dressers (III)	304.0
76	Tobacco factory operatives (III)	299.6
120	Other dock laborers [a] (V)	284.7
66	Cutters of textile goods and clothing (not machine cutters) (III)	280.9
71	Skilled boot and shoe operatives, not clickers or cutters (III)	272.4
70	Boot and shoe clickers and cutters (III)	272.2
24	Other skilled glassworkers [b] (III)	270.0
122	Porters (V)	269.2
36	Coppersmiths (III)	266.1
68	Hat formers, plankers and stiffeners (III)	259.5
164	General undefined laborers (V)	246.8
80	French polishers (wood polishers) (III)	245.5
154	Waiters (III)	242.2
157	Chimney sweeps (III)	240.4
15	Slate miners and quarriers (IV)	238.4
54	Wool and worsted card, comb or frame (not spinning frame) tenters (IV)	238.0
75	Cellarmen (IV)	236.0
130	Insurance agents and canvassers (III)	234.7
148	Actors (III)	229.4
48	Skilled lime and tanyard workers, curriers, and leather dressers (III)	225.4
156	Hairdressers, etc. (III)	217.0
23	Skilled glasshouse workers (III)	215.3
67	Tailors, tailors' pressers and machinists (III)	212.5
115	Omnibus and tram conductors (IV)	212.3
149	Musicians (III)	207.1
152	Inn, hotel keepers, publicans (II)	201.1
162	Packers (IV)	198.9
112	Drivers of horse-drawn vehicles (IV)	197.0
69	Boot and shoe makers and repairers (not factory workers) (III)	195.5
124b	Salesmen, etc., in businesses for the sale of grocery and provisions (III)	193.1
124c	Salesmen, etc., in businesses for the sale of textiles and clothing (III)	193.1
84	Hand compositors (III)	192.9
87	Printing machine minders and assistants; machine rulers (III)	186.6
44	Tinsmiths and sheet-metal workers (III)	186.6
158	Clerks (not civil service or local authority); typists (II)	185.6
160	Warehousemen (III)	172.9
110	Railway porters and lampmen (IV)	172.1
32	Machine tool workers and metal spinners (IV)	165.4
124	Salesmen and shop assistants (III)	162.9
	All occupied and retired males	149.6

[a] Exclusive of stevedores, and coal-boat loaders and dischargers.
[b] Exclusive of skilled glasshouse workers, and glass blowers and finishers (not machine hands).

[19] The standardized rates in this table and the succeeding tables will not be found in the registrar general's report. They were obtained by multiplying the comparative mortality figures by a factor—the rate for all causes among all occupied and retired males.

In the present occupational classification of the English census, it has been possible to distinguish between underground and other tin and copper miners, and between grinders in the cutlery trade and others in the group previously termed "cutlery, scissors grinder." As a result we find the sensationally high rates, respectively, of 1,886 and 1,178 per 100,000 population, while the "all occupied and retired" rate is 150. These occupations show the result of a specific hazard—silica dust—as do several others in this list. In fact, the table suggests that dust is the one industrial hazard of a specific nature causing high rates from respiratory tuberculosis. However, there are general or indirect causes affecting the rates in many occupations. Impossible as it is to separate out the factors responsible in occupations such as barmen, costermongers, stevedores, porters, etc., it is clear that there are excessive rates in many occupations and that an important problem for the industrial hygienist is the isolating of the factors responsible. With regard to this point, the British report states that "the mortalities for separate occupations are very largely governed by their social circumstances."

If the general living conditions are the cause of the high rates in some particular occupations, there might be expected to be noted also a high death rate from all causes. Some meaning thus attaches to the relation between the rate for tuberculosis and that for all causes for a particular occupation. A supplementary table has been prepared to give the ratio of the standardized respiratory tuberculosis rate to that for all other causes. The rate for respiratory tuberculosis was first deducted from that for all causes to make the ratio more sensitive. These ratios must not be confused with proportionate mortality. They have been based on rates adjusted for differences in age in the various occupations. Such differences are a very serious obstacle in proportionate mortality figures for a disease like tuberculosis, because the difference is likely to produce one effect on the tuberculosis death rate and the opposite on the "all-cause" rate. Occupational groups with a large proportion of young persons will have a high percentage of deaths from tuberculosis and a low percentage from all causes; the reverse will be true of occupations with a large proportion of old persons. This error is largely corrected in the present comparison, where the ratio is based on standardized rates. The table has been carried down only to ratios of 25, to save space and concentrate attention on the occupations having real hazards. Occupations with ratios below this limit are quite likely to reflect living or social conditions rather than industrial hazards.

TABLE 7.—*Ratio of standardized respiratory tuberculosis rate to that for all other causes,[1] by occupations*

Occupation group No.	Occupation	Ratio	Rank in previous table	Rank here
18a	Tin and copper mine, underground workers (III)	90.6	1	1
13	Tin and copper miners, not superintending staff (III)	79.4	2	2
40a	Grinders in the cutlery trade (IV)	64.2	3	3
40	Metal grinders (IV)	54.3	4	4
95	Slate masons and slate workers (III)	54.1	5	5
101	Drafters and brush makers (III)	41.7	9	6
37	Cutlers (III)	40.2	11	7
76	Tobacco factory (III)	39.8	19	8
15	Slate miners and quarriers (IV)	38.1	32	9
18	Potters' mill workers; slip makers; potters (III)	37.7	6	10
70	Boot and shoe clickers and cutters (III)	36.9	23	11
36	Coppersmiths (III)	36.5	26	12
71	Skilled boot and shoe operatives (III)	36.2	22	13
66	Cutters of textile goods and clothing (III)	35.7	21	14
35	Brass finishers and turners (III)	35.2	16	15
130	Insurance agents and canvassers (III)	32.8	35	16
41	Metal glazers and polishers (IV)	31.7	14	17
94	Masons, stone cutters, and dressers (III)	31.5	18	18
160a	Warehousemen, textiles and clothing (III)	30.8	17	19
115	Omnibus and tram conductors (IV)	30.6	41	20
157	Chimney sweeps (III)	30.5	31	21
67	Tailors, tailors' pressers, and machinists (III)	29.7	40	22
30	Brass foundry furnacemen and laborers (IV)	29.4	15	23
124b	Salesmen—sale of groceries and provisions (III)	29.3	47	24
118	Stevedores (IV)	29.2	13	25
127	Costermongers, hawkers, and street sellers (V)	29.1	10	26
153	Barmen (IV)	29.1	7	27
48	Skilled lime and tanyard workers, curriers, etc. (III)	28.5	37	28
80	French polishers (III)	27.9	29	29
38	File cutters (III)	27.5	8	30
84	Hand compositors (III)	26.5	49	31
24	Other skilled glassworkers (III)	26.3	24	32
120	Other dock laborers (V)	25.5	20	33
68	Hat formers, plankers, stiffeners (III)	25.5	27	34
87	Printing-machine minders and assistants (III)	25.4	50	35
44	Tinsmiths and sheet-metal workers (III)	25.3	51	36
20	Earthenware, china, etc., kiln and oven men (III)	25.1	12	37
	All occupied and retired males	19.5		
	Social class V	22.2		

[1] All other causes equals 100.

The significance of dust as a cause of occupational tuberculosis is stressed in this table. Of the first 20 occupations in the list, not more than 2 or 3 can be regarded as nondusty. Quite evidently the dust is primarily silica. Many dusty occupations which previously ranked some distance down the list have now taken a position near the top, such as tobacco-factory employees (rank 19 to rank 8), slate miners, and quarriers (32 to 9), boot and shoe clickers, and cutters (23 to 11). On the other hand, occupations where the hazard is nonspecific or where conditions outside the factory are responsible have been moved down, such as barmen (rank 7 to rank 27), costermongers (10 to 26), stevedores (13 to 25), other dock laborers (20 to 33). These are groups in which alcoholism may be thought to play an important rôle.

It is still apparent that there is an excess of tuberculosis in certain occupations where some other specific hazard besides dust may exist—e. g., in tailors and cutters of textile goods, boot and shoe clickers

and skilled boot and shoe operatives, hand compositors and machine compositors, printing-machine minders, and bookbinders.

CHRONIC INTERSTITIAL PNEUMONIA

This cause of death is used as a generic title for such forms of disease as fibroid phthisis, fibrosis of the lungs, silicosis, miners' phthisis, etc., when returned as nontuberculous. Thus it may be most appropriately discussed at this point rather than under acute pneumonia. The disease is purely occupational in nature (where correctly returned), and only 398 deaths were so classified in all occupations in the three years. The table follows:

TABLE 8.—*Standardized mortality from chronic interstitial pneumonia in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
13a	Tin and copper mine—underground workers, not superintending staff (III)	499.9
13	Tin and copper miners, not superintending staff (III)	330.3
40a	Grinders in the cutlery trade (IV)	60.6
94b	Masons, sandstone (III)	56.1
14c	Stone miners, quarriers and sandstone (IV)	34.1
40	Metal grinders (IV)	30.7
94a	Masons, limestone (III)	28.0
94	Masons, stonecutters and dressers (III)	26.7
12	Iron-ore mine, underground workers, not superintending staff (III)	16.4
18	Potters' mill workers; slip makers; potters (III)	*15.7
21	Brick, tile, etc., kiln and oven men (III)	*14.3
14	Stone miners and quarriers (IV)	10.6
9	Coal mine, persons making and repairing roads (IV)	5.4
22	Other persons engaged in the manufacture of bricks, tiles, and pottery (V)	*4.0
14b	Stone miners, quarriers and limestone (IV)	3.7
7	Coal mine, hewers and getters (III)	3.1
	All occupied and retired males	1.2

* Difference less than 3 times the probable error.

The starred rates are included, although not three times the probable error. They are still suggestive of a hazard, since we are dealing with a cause of death which presumably does not occur except where a hazard exists. It should be stated, though, that not more than four deaths occurred in any one of these occupations.

In regard to these figures, the British report makes a comment which should be included here:

The enormous preponderance of Cornish miners' mortality in this list may not altogether represent the facts, for it is very natural that in a case like this, where many instances of a disease rare elsewhere are met within a limited area, it should there be more completely distinguished in certification from other similar forms of disease. Nearly all of the mortality represented in the above list, it will be noticed, is associated in one way or another with stone, whether this is worked in mining for tin and copper, coal, iron ore, or in stone mining and quarrying and dressing. The potters' risk may be attributed to the flint dust used, and the metal grinders' to the dust from grindstones, but it is difficult to conceive of any special occupational risk accounting for the four deaths of artists. It

will be noticed that the risk for coal miners is highest in the case of the makers and repairers of road, who drive shafts and passages through the rock, giving access for the hewers to the working places where the coal itself is cut.

The reader will not fail to notice the contrast between the rates among workers in sandstone compared with those among workers in limestone.

Owing to the large numbers involved, it is of importance to note especially the rates for coal miners. (Occupational groups 7 and 9.)

BRONCHITIS

The table for bronchitis follows:

TABLE 9.—*Standardized mortality from bronchitis in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
40a	Grinders in the cutlery trade (IV)	330. 5
55	Cotton strippers and grinders and card-room jobbers (IV)	253. 2
18	Potters' mill workers; slip makers; potters (III)	246. 7
13a	Tin and copper mine, undergound workers, not superintending staff (III)	227. 1
20	Earthenware, china, etc., kiln and oven men (III)	222. 1
13	Tin and copper miners, not superintending staff (III)	176. 4
23a	Glass blowers and finishers, not machine hands (III)	146. 0
40	Metal grinders (IV)	143. 2
51	Cotton blow room operatives, skilled (IV)	137. 1
127	Costermongers, hawkers, and street sellers (V)	122. 1
27a	Puddlers (III)	121. 9
23	Skilled glasshouse workers (III)	120 3
22	Other persons engaged in the manufacture of bricks, tiles, and pottery (V)	120. 0
101	Drafters and brush makers (III)	115. 1
120	Other dock laborers (V)	113. 7
24	Other skilled glassworkers (III)	113. 4
122	Porters (V)	98. 7
104	Gas stokers (IV)	96. 2
112	Drivers of horse-drawn vehicles (IV)	92. 8
64	Dye mixers and dyers (IV)	90. 9
153	Barmen (IV)	90. 6
94	Masons, stone cutters, and dressers (III)	90. 5
41	Metal glazers, polishers, buffers, and moppers (IV)	89. 0
58	Cotton doublers, winders, warpers, beamers, etc. (III)	88. 9
164	General and undefined laborers (V)	88. 3
29	Iron foundry furnacemen and laborers (IV)	82. 6
11	Coal mine—workers above ground, not superintending staff (IV)	81. 0
35	Brass finishers and turners (III)	80. 3
124a	Salesmen, etc., in businesses for sale of fish, meat, green grocery, milk (III)	79. 0
28	Metal molders (III)	78. 2
10	Coal mine, other workers below ground (IV)	75. 6
60	Cotton weavers (III)	74. 9
43	Riveters and their laborers (III)	72. 5
8	Coal mine, persons conveying material to the shaft (IV)	70. 4
56	Cotton spinners and piecers (III)	65. 0
7	Coal mine, hewers and getters (III)	64. 7
9	Coal mine, persons making and repairing roads (IV)	64. 4
162	Packers (IV)	63. 5
110	Railway porters and lampmen (IV)	60. 8
27	Persons engaged in smelting, rolling, converting of iron and steel (IV)	58. 5
	All occupied and retired males	45. 4

Like respiratory tuberculosis, bronchitis varies closely with social class, the standardized rate in class V being seven times that in class I, and there are no doubt several occupations in this table which have an excessive rate because of the living and economic conditions of the group; but it is striking that the highest rates appear among skilled workers and reflect, as in the case of tuberculosis, specific

hazards like dust. The high rate among cotton workers suggests that other dusts besides silica are important here, while they did not seem important as predisposing to tuberculosis.

It is to the point to contrast the bronchitis mortality of cotton workers with that of woolen workers in similar jobs, the standardized rates being as follows:

	Cotton	Wool
Carders	74.8	98.8
Spinners	65.0	23.3
Doublers	88.9	35.9
Weavers	74.9	38.3
All occupied	45.4	

If dust is to be regarded as more or less responsible for the high mortality among carders, in both wool and cotton, it is suggested that high temperature (with accompanying high humidity) is a major factor. As the British report states, "Of the three occupations involving high working temperatures in the cotton industry the spinners suffer a bronchitis mortality nearly three times as high in cotton as in wool, doublers about two and a half times, and weavers nearly twice as high."

PNEUMONIA

A table for pneumonia is next given:

TABLE 10.—*Standardized mortality from pneumonia in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
30	Brass foundry furnacemen and laborers (IV)	194.1
40a	Grinders in the cutlery trade (IV)	180.9
118	Stevedores (IV)	180.5
51	Cotton blow room operatives, skilled (IV)	177.4
29	Iron foundry furnacemen and laborers (IV)	176.8
53	Cotton card and frame (not spinning frame) tenters (IV)	169.8
27a	Puddlers (III)	158.7
120	Other dock laborers (V)	156.1
127	Costermongers, hawkers, and street sellers (V)	154.1
153	Barmen (IV)	149.0
40	Metal grinders (IV)	146.8
122	Porters (V)	139.3
24	Other skilled glass workers (III)	134.1
28	Metal molders (III)	133.1
164	General and undefined laborers (V)	131.2
152	Inn, hotel keepers, publicans (II)	125.4
112	Drivers of horse-drawn vehicles (IV)	124.3
104	Gas stokers (IV)	123.5
35	Brass finishers and turners (III)	120.1
27	Persons engaged in smelting, rolling, converting of iron and steel (IV)	117.8
154	Waiters (III)	116.1
139	Registered medical practitioners (I)	113.4
43	Riveters and their laborers (III)	105.3
10	Coal mine, other workers below ground (IV)	104.7
44	Tinsmiths and sheet metal workers (III)	103.8
116	Grooms and horse keepers (IV)	101.4
124a	Salesmen, etc., in businesses for sale of fish, meat, green grocery, milk (III)	96.0
162	Packers (IV)	95.9
123a	Proprietors, etc., of businesses for sale of fish, meat, green grocery, milk (II)	95.1
11	Coal mine—workers above ground, not superintending staff (IV)	94.6
	All occupied and retired males	77.9

Among the occupations with high mortality from pneumonia are several in which the workers are exposed to trying alternations of temperature, such as puddlers and iron and brass foundry workers, and cotton workers. Of not less importance is the group of occupations exposed to dust of one sort or another, such as metal polishers, cutlery grinders, including several occupations in which both dust and high temperature appear to be factors. Rates are also high among the group exposed to adverse weather conditions—dock laborers, drivers of horse-drawn vehicles, riveters, stevedores, etc.

It is important to note that tin and copper miners do not have an excess mortality from acute pneumonia.

TOTAL RESPIRATORY DISEASE (EXCLUSIVE OF TUBERCULOSIS AND INFLUENZA)

There is a certain confusion between mortality from bronchitis and pneumonia. In some cases deaths returned as pneumonia in the higher social classes would be returned as bronchitis in the lower. Therefore, it is desirable to consider also the total respiratory group. Following the custom of the International List, this group is exclusive of influenza and tuberculosis. The former could not affect the total appreciably, and in view of the specific relation of tuberculosis to silica dust exposure, it seems well not to confuse the general respiratory mortality with the inclusion of that cause.

TABLE 11.—*Standardized mortality from diseases of the respiratory system in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
13a	Tin and copper mine, underground workers, not superintending staff (III)	878.4
40a	Grinders in the cutlery trade (IV)	640.0
13	Tin and copper miners, not superintending staff (III)	603.5
20	Earthenware, china, etc., kiln and oven men (III)	407.4
55	Cotton strippers and grinders and card-room jobbers (IV)	398.4
18	Potters' mill workers, slip makers; potters (III)	396.4
40	Metal grinders (IV)	341.1
51	Cotton blow-room operatives, skilled (IV)	337.5
118	Stevedores (IV)	324.3
127	Costermongers, hawkers, and street sellers (V)	308.4
120	Other dock laborers (V)	294.6
30	Brass foundry furnace men and laborers (IV)	292.9
27a	Puddlers (III)	292.0
53	Cotton card and frame (not spinning frame) tenters (IV)	287.5
103	Shipyard laborers, etc. (V)	277.8
24	Other skilled glass workers (III)	274.2
29	Iron foundry furnace men and laborers (IV)	272.9
158	Barmen (IV)	264.2
41	Metal glazers, polishers, buffers, and moppers (IV)	261.5
122	Porters (V)	256.6
23a	Glass blowers and finishers, not machine hands (III)	254.8
164	General and undefined laborers (V)	241.8
112	Drivers of horse-drawn vehicles (IV)	240.4
101	Drafters and brush makers (III)	230.3
28	Metal molders (III)	231.1
104	Gas stokers (IV)	228.2
94	Masons, stone cutters, and dressers (III)	226.5
54	Wool and worsted card, comb or frame (not spinning frame) tenters (IV)	224.1
23	Skilled glasshouse workers (III)	221.2

TABLE 11.—*Standardized mortality from diseases of the respiratory system in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*—Continued

Occupation group No.	Occupation	Mortality rate
58	Cotton doublers, winders, warpers, beamers, etc. (III)	218.1
35	Brass finishers and turners (III)	217.8
64	Dye mixers and dyers (IV)	214.8
10	Coal mine, other workers below ground (IV)	201.9
27	Persons engaged in smelting, rolling, converting of iron and steel (IV)	200.6
11	Coal mine, workers above ground, not superintending staff (IV)	119.5
124a	Salesmen, etc., in businesses for sale of fish, meat, green groceries, milk (III)	188.8
152	Inn, hotel keepers, publicans (II)	187.1
80	French polishers (III)	185.5
43	Riveters and their laborers (III)	184.0
9	Coal mine, persons making and repairing roads (IV)	182.8
56	Cotton spinners and piecers (III)	176.7
117	Bargemen and boatmen (IV)	175.8
8	Coal mine, persons conveying material to the shaft (IV)	173.8
162	Packers (IV)	172.9
116	Grooms and horse keepers (IV)	168.6
7	Coal mine hewers and getters (III)	159.1
123a	Proprietors, etc., of businesses for sale of fish, meat, green groceries, milk (II)	157.3
	All occupied and retired males	138.8

Occupations with high rates may be divided into five groups:

(*a*) Dusty trades—tin and copper miners, grinders in cutlery trades, kiln and oven men, cotton strippers and grinders and card-room jobbers, potters, etc.

(*b*) Trades exposed to high temperatures (with or without high humidity)—brass foundry furnace men, puddlers, cotton workers, etc.

(*c*) Trades with general exposure to bad weather conditions—shipyard laborers, stevedores, other dock laborers, costermongers, drivers of horse-drawn vehicles, etc.

(*d*) Trades which have a tendency to collect groups of inferior physical types—costermongers, drivers of horse-drawn vehicles, etc.

(*e*) Trades in which there is an excessive amount of drinking—barmen, porters, etc.

The significance of respiratory conditions aside from tuberculosis in their relation to industrial health will promptly be recognized.

Under bronchitis was given a comparison as to cotton and wool workers. Similar figures are desirable for respiratory diseases as a whole, and are as follows:

	Cotton	Wool
Carders	287.5	224.1
Spinners	176.7	109.4
Doublers	218.1	109.0
Weavers	149.2	93.3
All occupied	138.8	

In regard to these rates, let us quote the following from the registrar general's report:

The spinning, doubling, and weaving of cotton are carried on at high temperatures (70° to 80°) in order to soften the waxy content of the fiber, and so render it more easily worked while carding-room processes do not involve this requirement. The carders' mortality does not differ greatly in the two industries, being higher from bronchitis for wool and from pneumonia for cotton. Thus it appears that for three textile occupations involving for cotton (but not for wool) workers exposure to artificial heat and moisture, respiratory disease mortality is above average for the cotton workers so exposed and well below it for the woolen workers not subject to these conditions, whereas for carders, who are exposed to much dust but little heat, there is excess in both industries.

INFLUENZA

There is added a table for influenza, although this disease is of minor importance from an occupational point of view.

TABLE 12.—*Standardized mortality from influenza in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
12	Iron ore mine, underground workers, not superintending staff (III)	69.4
64	Dye mixers and dyers (IV)	59.7
29	Iron foundry furnacemen and laborers (IV)	59.6
10	Coal mine, other workers below ground (IV)	58.6
11	Coal mine, workers above ground, not superintending staff (IV)	57.2
117	Bargemen and boatmen (IV)	55.9
9	Coal mine, persons making and repairing roads (IV)	55.6
152	Inn, hotel keepers, publicans (II)	51.5
28	Metal molders (III)	47.0
27	Persons engaged in smelting, rolling, converting of iron and steel (IV)	44.8
164	General and undefined laborers (V)	44.5
8	Coal mine, persons conveying material to the shaft (IV)	44.5
112	Drivers of horse-drawn vehicles (IV)	42.4
7	Coal mine, hewers and getters (III)	36.7
	All occupied and retired males	33.3

Only one occupation (iron ore miners, underground) reveals a death rate twice that of all occupied males. It is perhaps of moment that all of the coal mine groups show an excess. In fact, of the 14 occupations in the list 5 are coal. It should also be observed that iron foundry furnacemen and laborers, metal molders, and persons engaged in smelting, rolling, and converting of iron and steel have rates significantly above those for all occupied.

DISEASES OF HEART

A table for valvular heart disease and one for "other" (chiefly myocardial) heart disease are next given.

TABLE 13.—*Standardized mortality from valvular disease of the heart in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
55	Cotton strippers and grinders and card-room jobbers (IV)	119.7
153	Barmen (IV)	117.4
11	Coal mine, workers above ground, not superintending staff (IV)	95.0
164	General and undefined laborers (V)	86.9
56	Cotton spinners and piecers (III)	86.6
64	Dye mixers and dyers (IV)	84.9
124a	Salesmen, etc., in businesses for sale of fish, meat, green grocery, milk (III)	84.8
60	Cotton weavers (III)	82.0
112	Drivers of horse-drawn vehicles (IV)	78.6
152	Inn, hotel keepers, publicans (II)	77.2
8	Coal mine, persons conveying material to the shaft (IV)	74.5
163	Stationary engine and crane drivers (III)	73.2
123a	Proprietors, etc., of businesses for sale of fish, meat, green grocery, milk (II)	71.9
10	Coal mine, other workers below ground (IV)	71.7
160	Warehousemen (III)	70.5
98	Painters and decorators (III)	65.6
	All occupied and retired males	58.0

TABLE 14.—*Standardized mortality from other heart disease in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
13a	Tin and copper mine, underground workers, not superintending staff (III)	194.7
40a	Grinders in the cutlery trade (IV)	170.1
137	Barristers (I)	150.9
68	Hat formers, plankers, stiffeners (III)	139.1
20	Earthenware, china, etc., kiln and oven men (III)	127.4
75	Cellarmen (IV)	121.8
152	Inn, hotel keepers, publicans (II)	108.8
153	Barmen (IV)	107.6
40	Metal grinders (IV)	107.3
41	Metal glazers, polishers, buffers, and moppers (IV)	103.6
127	Costermongers, hawkers, and street sellers (V)	99.6
122	Porters (V)	99.4
123a	Proprietors, etc., of businesses for sale of fish, meat, green grocery, milk (II)	98.4
124a	Salesmen, etc., in businesses for sale of fish, meat, green grocery, milk (III)	96.3
156	Hairdressers, etc (III)	80.4
112	Drivers of horse-drawn vehicles (IV)	79.3
123	Proprietors and managers of wholesale or retail dealing businesses (II)	78.8
123b	Proprietors, etc., of businesses for the sale of groceries and provisions (II)	76.9
164	General and undefined laborers (V)	76.5
67	Tailors, tailors' pressers, and machinists (III)	75.4
125	Commercial travelers (II)	74.3
	All occupied and retired males	60.0

In the case of valvular heart disease, two quite unlike occupations stand at the top (cotton strippers, etc., and barmen). Although this cause of disease apparently does not reflect occupational differences to the same extent as "other" heart diseases, it should be noted that cotton spinners and weavers (as well as strippers) have rates very much above those for all occupied. Another group with high rates is that of coal miner, an extremely strenuous occupation.

For myocardial disease the order of the occupations with the highest rates is quite different. In fact, very little association between these two causes of death can be found. Quite a number of occupa-

tions have extraordinarily high rates for "other" heart disease, the most interesting feature being the great variations in the nature of the occupations from tin miner to barrister to barmen.

There is a suggestion of an association between myocardial disease and silica risk, in regard to which the registrar general states:

The association * * * between heart disease and silica risk can not, unfortunately, be measured directly, as the deaths ascribed either to silicosis or to chronic interstitial pneumonia are far too few to make this possible. It is worth noting, however, that there is a significant correlation between mortality (164 occupations) from bronchitis and chronic nephritis, $r = +0.380 \pm 0.045$. Chronic nephritis has been seen to be associated with heart disease, and bronchitis certainly often results from silicosis. If the latter is a cause of chronic nephritis, it may conceivably be a cause also of similar degenerative changes in the heart muscle. But association of these degenerative diseases may of course be independent of silicosis. Little more than vague speculation is possible without some more effective appraisement of the incidence of silicosis on occupations than is at present supplied by the mortality returns.

CEREBRAL HEMORRHAGE

A number of occupations have strikingly high rates from cerebral hemorrhage. The data are given in the next table.

TABLE 15.—*Standardized mortality from cerebral hemorrhage, etc., in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
13a	Tin and copper mine, underground workers, not superintending staff (III)	156.5
53	Cotton card and frame (not spinning frame) tenters (IV)	125.9
13	Tin and copper miners, not superintending staff (III)	122.6
36	Coppersmiths (III)	108.6
153	Barmen (IV)	77.0
152	Inn, hotel keepers, publicans (II)	72.6
156	Hairdressers, etc. (III)	68.3
60	Cotton weavers (III)	67.4
98	Painters and decorators (III)	64.8
124a	Salesmen, etc., in businesses for sale of fish, meat, green grocery, milk (III)	61.7
89	Employers, managers in the building, etc., trades, clerks of works (II)	59.4
42	Plumbers (III)	58.7
56	Cotton spinners and piecers (III)	58.5
11	Coal mine workers above ground, not superintending staff (IV)	57.6
9	Coal mine, persons making and repairing roads (IV)	56.1
112	Drivers of horse-drawn vehicles (IV)	54.1
8	Coal mine, persons conveying material to the shaft (IV)	52.9
123a	Proprietors, etc., of businesses for sale of fish, meat, green grocery, milk (II)	52.5
164	General and undefined laborers (V)	51.8
32	Machine tool workers and metal spinners (IV)	49.9
33	Fitters, tool setters, millwrights, and similar occupations (III)	47.9
	All occupied and retired males	41.1

It seems difficult at the present time to explain such extraordinary rates, several of them more than twice as high as that of all occupied and retired males, occurring in widely varying occupations.

It might be mentioned that the registrar general has determined the correlation between mortality from cerebral hemorrhage and that from chronic nephritis to be $.66 \pm .03$, emphasizing a point long understood in clinical medicine.

DIGESTIVE DISEASES AND CHRONIC NEPHRITIS

For brevity the next three tables are treated together.

TABLE 16.—*Standardized mortality from diseases of the digestive system in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
137	Barristers (I)	261.0
152	Inn, hotel keepers, publicans (II)	187.9
74	Brewers of ale, stout, and porter (IV)	170.5
153	Barmen (IV)	125.6
148	Actors (III)	119.6
140	Dentists (I)	101.1
160a	Warehousemen, textiles and clothing (III)	100.5
139	Registered medical practitioners (I)	86.6
122	Porters (V)	77.7
125	Commercial travelers (II)	76.6
123b	Proprietors, etc., of businesses for the sale of groceries and provisions (II)	75.8
123a	Proprietors, etc., of businesses for sale of fish, meat, green grocery, milk (II)	75.2
120	Other dock laborers (V)	72.4
123	Proprietors and managers of wholesale or retail dealing businesses (II)	70.1
112	Drivers of horse-drawn vehicles (IV)	67.4
46	Electrical engineers, fitters, and wiremen (III)	66.2
164	General and undefined laborers (V)	63.6
158	Clerks (not civil service or local authority); typists (II)	59.8
	All occupied and retired males	54.4

TABLE 17.—*Standardized mortality from peptic ulcer in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
137	Barristers (I)	157.9
153	Barmen (IV)	43.6
160a	Warehousemen, textiles and clothing (III)	37.6
152	Inn, hotel keepers, publicans (II)	26.4
112	Drivers of horse-drawn vehicles (IV)	22.4
46	Electrical engineers, fitters, and wiremen (III)	22.3
110	Railway porters and lampmen (IV)	22.0
164	General and undefined laborers (V)	19.2
	All occupied and retired males	14.5

TABLE 18.—*Standardized mortality from chronic nephritis in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
38	File cutters (III)	196.7
57	Wool and worsted spinners and piecers (III)	91.4
153	Barmen (IV)	81.2
152	Inn, hotel keepers, publicans (II)	71.5
156	Hairdressers, etc. (III)	60.9
42	Plumbers (III)	60.5
98	Painters and decorators (III)	60.1
123a	Proprietors, etc., of businesses for sale of fish, meat, green grocery, milk (II)	50.8
127	Costermongers, hawkers, and street sellers (V)	47.5
124a	Salesmen, etc., in businesses for sale of fish, meat, green grocery, milk (III)	47.3
56	Cotton spinners and piecers (III)	47.1
89	Employers, managers in the building, etc., trades; clerks of works (II)	45.5
123b	Proprietors, etc., of businesses for the sale of groceries and provisions (II)	44.8
29	Iron foundry furnacemen and laborers (IV)	44.1
112	Drivers of horse-drawn vehicles (IV)	41.4
123	Proprietors and managers of wholesale or retail dealing businesses (II)	40.6
164	General and undefined laborers (V)	40.0
	All occupied and retired males	31.6

It is difficult to separate the effect of specific occupational factors from the factor of intemperance in the case of these diseases. We find consistently high rates for publicans, brewers, barmen, porters, commercial travelers, etc., groups in which alcohol must be regarded as an important contributory factor and in which cirrhosis of the liver also shows a high mortality rate. Aside from alcoholic indulgence, dietary intemperance plays a part. Between the two the effect of any specific hazard is more or less obliterated. One is not sure, in examining the table for digestive diseases, whether these two points do not really explain every high rate. Few occupations show significantly high rates for ulcer of the stomach. The extraordinary rate for barristers, although significant as judged by the probable error, still contains a great deal of chance fluctuation, due to the small group. The probable error of the rate is 29.

In the case of chronic nephritis, the effect of alcoholism is pronounced, but other factors are at work, such as association with lead poisoning (plumbers, painters, and decorators). It might be stated that in all previous reports file cutters have exhibited definite mortality from lead poisoning, so that this association may be responsible for their position in this table.

No table has been prepared for diabetes, but it is of interest to note the high rates from this cause among glassworkers. Glass blowers, other skilled glasshouse workers, and other glass workers (i. e., not in the glasshouse) all have an unusual mortality from diabetes, a fact which appears to be very significant to the registrar general. He notices the fact that none of the deaths among glassworkers occurred at ages over 65, with 60 per cent at ages 55–64, which in itself may be significant of some occupational influence.

LEAD POISONING

No special table has been prepared for deaths from lead poisoning, because of the small number classified specifically under this heading (150 for the three years). These deaths were distributed as follows:

Potters	27
Plumbers	18
Occupations akin to plumbing	4
Painters and decorators	69
Other deaths probably due to paint	2
Workers in white and red lead	7
All other occupations	23

No new information as to lead hazard is contained in these figures. It should be observed that only one death was assigned to accumulator (battery) makers and pasters. However, the group is small and this occupation had not been pursued for very long when these returns were made (1921–1923). Even this one death gives a crude

rate of 73 while that for all occupied and retired males is little more than 1.

CANCER

The table for cancer follows:

TABLE 19.—*Standardized mortality from cancer (all sites) in occupations with rates above average, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	Mortality rate
154	Waiters (III)	235.3
75	Cellarmen (IV)	211.6
153	Barmen (IV)	210.3
56	Cotton spinners and piecers (III)	193.6
104	Gas stokers (IV)	187.7
122	Porters (V)	182.8
157	Chimney sweeps (III)	[1] 181.3
88	Bookbinders and pattern card makers (III)	176.9
149	Musicians (III)	176.8
40	Metal grinders (IV)	176.6
160a	Warehousemen, textiles and clothing (III)	175.9
35	Brass finishers and turners (III)	170.9
112	Drivers of horse-drawn vehicles (IV)	168.3
120	Other dock laborers (V)	167.2
164	General and undefined laborers (V)	162.1
115	Omnibus and tram conductors (IV)	155.4
152	Inn, hotel keepers, publicans (II)	149.8
124c	Salesmen, etc, in businesses for the sale of textiles and clothing (III)	148.6
25	Chemical workers (IV)	146.2
28	Metal molders (III)	145.5
125	Commercial travelers (II)	144.3
124a	Salesmen, etc, in businesses for sale of fish, meat, green groceries, milk (III)	143.3
162	Packers (IV)	141.2
27	Persons engaged in smelting, rolling, converting of iron and steel (IV)	135.8
31	Smiths and skilled forge workers (III)	131.2
	All occupied and retired males	117.5

[1] Difference is less than 3 times the probable error.

In view of present speculation as to the causes of cancer, its relation to occupation, is one of the deepest interest. The registrar general has appreciated this and gives to this disease a great deal of careful thought, and anyone working in this field should refer to the volume itself. Here it is possible only to point out what groups of workers have high rates from cancer.

1. Those exposed to soot and various coal-tar preparations (gas stokers, chimney sweeps).[11]

2. Those exposed to certain food and drink conditions (waiters, barmen, publicans). The registrar general suggests that cancer of the upper alimentary tract is largely influenced by food and drink. In connection with these occupations (and also cellarmen, porters, other dock laborers), it should be noted that Hope gives as one of the groups with high rates from cancer those having an excessive mortality from alcoholism.[12]

[11] The difference between the rate for chimney sweeps and that for all occupied males was not three times the probable error of the former, but was, nevertheless, included because of past experience and the fact that the rates in various ages are consistently higher for sweeps.

[12] Hope, Hanna and Stallybrass: Industrial Hygiene and Medicine, p. 414.

3. Those exposed to chemical fumes (chemical workers).

4. Those exposed to metallic dusts and fumes (metal grinders, brass finishers and turners, metal molders, persons engaged in smelting, rolling, converting of iron and steel, smiths, and skilled forge workers).

5. One specific occupational disease, cotton spinners' scrotal cancer. No satisfactory analysis is possible without consideration of site, and this is not possible in this review.

V. Summary of Standardized Rates by Occupation

By way of summary of the preceding tables according to important diseases, the rates have been assembled in a single table, the causes being placed in successive columns. Thus is permitted a picture of a fundamentally important fact—the relation of different causes of death in the same occupation. The occupations are arranged according to the order of mortality for all causes. As before, there are given only the rates in which the difference between the rate and that for all occupied and retired males is three times the probable error of the particular rate.[13] Also, as an abbreviation of the table, there are shown only occupations for which the rate for all causes is 10 per cent greater than that for all occupied and retired males.

TABLE 20.—*Standardized mortality, by occupation and cause, males aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	All causes	Respiratory tuberculosis	Bronchitis	Pneumonia	Influenza	Valvular heart	Other heart	Cerebral hemorrhage	Digestive diseases	Peptic ulcer	Chronic nephritis	Cancer (all sites)
13a	Tin and copper, underground (III)	3,966	1,886	227				195	157				
40a	Grinders, cutlery trade (IV)	3,015	1,179	331	190			170					
13	Tin and copper (III)	2,990	1,324	176					123				
40	Metal grinders (IV)	1,809	637	143	147			107					177
153	Barmen (IV)	1,789	403	91	149		117	108	77	126	44	81	210
38	File cutters (III)	1,694	365									197	
20	Earthenware, china, etc. (III)	1,674	336	222				127					
127	Costermongers, hawkers, etc. (V)	1,519	342	122	154			100				47	
18	Potters' mill workers, etc. (III)	1,502	411	247									
118	Stevedores (IV)	1,481	334		189								
53	Cotton, card, and frame tenters (IV)	1,465			170				126				
95	Slate masons and slate workers (III)	1,460	513										
152	Inn, hotel keepers, publicans (II)	1,450	201		125	51	77	109	73	188	26	71	150
120	Other dock laborers (V)	1,402	285	114	156					72			167
30	Brass foundry (IV)	1,400	318		194								
51	Cotton blow-room operatives (IV)	1,387		137	177								
75	Cellarmen (IV)	1,382	236					122					212
122	Porters (V)	1,370	269	99	139			98		78			183
41	Metal glazers, polishers, etc. (IV)	1,320	318	80				104					
164	General and undefined laborers (V)	1,316	247	88	181	45	87	77	52	64	19	40	162
160a	Warehousemen (III)	1,300	306							101	38		176
21	Other skilled glass workers (III)	1,296	270	113	134								
19	Pottery dippers, glaziers, etc. (III)	1,293											
55	Cotton strippers, grinders, etc. (IV)	1,277		253			120						
68	Hat formers, plankers, etc. (III)	1,277	260					139					
94	Masons, cutters and dressers (III)	1,272	304	91									
112	Drivers of horse-drawn vehicles (IV)	1,261	197	93	124	42	79	79	54	67	22	41	168
54	Wool, card, or frame tenters (IV)	1,256	238										
103	Shipyard laborers, etc. (V)	1,236											
74	Brewers of ale, stout, porter (IV)	1,232								171			
148	Actors (III)	1,222	229							120			
154	Waiters (III)	1,210	242		116								235
161	Drafters and brush makers (III)	1,208	356	115									
23a	Glass blowers, finishers (III)	1,202		146									
64	Dye mixers and dyers (IV)	1,193		91		60	86						

[13] In case of Class V occupations, the rate for that class instead of the rate for all occupied is used as the basis of calculation.

TABLE 20.—*Standardized mortality, by occupation and cause, males aged 20–65, 1921–1923, England and Wales*—Continued

Occupation group No.	Occupation	All causes	Respiratory tuberculosis	Bronchitis	Pneumonia	Influenza	Valvular heart	Other heart	Cerebral hemorrhage	Digestive diseases	Peptic ulcer	Chronic nephritis	Cancer (all sites)
35	Brass finishers and turners (III)	1,183	308	80	120								171
117	Bargemen and boatmen (IV)	1,180				56							
104	Gas stokers (IV)	1,179		96	123								188
37	Cutlers (III)	1,175	337										
124a	Salesmen, fish, meat, etc. (III)	1,171		80	96		84	96	62			47	143
27a	Puddlers (III)	1,144		122	159								
56	Cotton spinners and piecers (III)	1,142		65			87		59			47	194
23	Skilled glasshouse workers (III)	1,138	215	120									
22	Other persons in manufacture of bricks, etc. (V)	1,137		120									
58	Cotton doublers, winders, etc. (III)	1,131		89									
156	Hairdressers, etc. (III)	1,129	217					80	68			61	
119	Coal boat loaders and dischargers (V)	1,126											
80	French polishers (III)	1,125	246										
10	Coal mine, workers below ground (IV)	1,122		76	105	59	72						
50	Wool sorters (III)	1,121											
149	Musicians (III)	1,116	207										177
8	Coal mine, persons conveying material to the shaft (IV)	1,102		70		45	75		53				
121	Messengers, hall porters, etc. (V)	1,098											
52	Rag grinders, wool willowers, etc. (IV)	1,096											
9	Coal mine, persons making and repairing roads (IV)	1,090		64		56			56				
11	Coal mine, workers above ground (IV)	1,082		81	95	57	95		58				
123a	Proprietors, fish, meat, etc. (II)	1,075			95		72	98	53	75		51	
137	Barristers (I)	1,071						151		261	158		
66	Cutters of textile goods and clothing (III)	1,069	281										
76	Tobacco factory operatives (III)	1,052	300										
28	Metal molders (III)	1,040		78	133	47							146
157	Chimney sweeps (III)	1,027	240										
71	Skilled boot and shoe, not clickers, cutters (III)	1,025	272										
29	Iron foundry furnacemen, laborers (IV)	1,021		83	177	60						44	
48	Skilled lime and tanyard workers, etc. (III)	1,017	225										
125	Commercial travelers (II)	1,014						74		77			144
70	Boot and shoe clickers and cutters (III)	1,010	272										
57	Wool and worsted spinners and piecers (III)	1,009										91	
88	Bookbinders and pattern card makers (III)	1,005											177
162	Packers (IV)	1,004	199	63	96								141
142	Music teachers (II)	1,003											

What is perhaps most impressive is the number of occupations with excessive rates from several causes. The group of barmen, for instance, have rates which are significantly above the average for all occupied and retired males for every disease in this list except influenza. Although confusion in putting down the correct cause of death and difficulties as to which of two causes is primary must be regarded as a factor here, there still remains a real and important correlation as to many causes of death. In the case of myocardial (other) heart disease, cerebral hemorrhage, and chronic nephritis, a close association is to be found.

The importance of selection in determining the mortality rates by occupation is strikingly demonstrated in the case of drivers of horse-drawn vehicles—a large group with no specific hazard. Here every cause of death in the table shows a significant excess.

Another point of great interest is the fact that certain diseases, such as tuberculosis, bronchitis, pneumonia, and "other" heart diseases, contribute largely to the excessive rates in the occupations at the top of the table, whereas others, such as influenza, valvular heart, cancer, are more or less scattered through the table.

In the old occupational classification of the Census Bureau all pottery workers were grouped under the title "potters; earthenware, etc., manufacture." Now this group is subdivided into kiln and oven men and kiln setters and placers (Group 20); potters' mill workers, slip makers, and potters (Group 18); and pottery dippers, glazers, painters, decorators (Group 19). The first two have a very excessive mortality from all causes—1,674 and 1,502, respectively—while the third is 1,293. The kiln and oven men show a marked excess for respiratory tuberculosis, bronchitis, and "other" heart disease; the potters for tuberculosis and bronchitis. In the case of the dippers and glazers the rates for no particular cause are significantly high.

One may be surprised not to find medical practitioners in this list. Since this group falls in social class I and our criterion of significance was based on all occupied and retired males, it is clear that this group may have rates for certain diseases higher than the average of their own social class and still have been omitted from all preceding tables. The writer felt that there was no necessity for any particular study of class I occupations. As a matter of fact, medical practitioners form a group with specific industrial hazards due to close contact with disease. They have a standardized rate of 1,021 as compared with 812 for social class I. Such an excess would mean nothing in contrast to all occupied males, and it is one of the great advantages of the present volume on occupational mortality that this differentiation as to social class may be made.[14] The physician will be interested to observe how his mortality from different causes compares with that of other persons in the same social class. Accordingly, a table is included giving the ratio of the rate of medical practitioners to that of class I as a whole, by cause, with the standardized rates. Those significantly above the rates for class I are in bold face.

TABLE 21.—*Ratio of standardized rates for registered medical practitioners to corresponding rate for social class I, by cause*

Cause	Ratio	Standardized rate	Cause	Ratio	Standardized rate
Accident	205	74.8	Bronchitis	117	13.6
Pneumonia	176	44.7	Cirrhosis of liver	114	16.8
Suicide	174	113.4	Cerebral hemorrhage	113	40.9
All respiratory (except tuberculosis and influenza)	160	140.9	"Other heart"	111	70.7
Influenza	153	42.5	Peptic ulcer	111	14.5
Chronic nephritis	138	43.3	Circulatory	101	180.4
All causes	126	934.0	Cancer	99	93.1
Digestive	125	86.6	All heart	99	96.2
Diabetes	125	17.4	Respiratory tuberculosis	95	69.2
Syphilis, etc	125	22.6	Appendicitis	93	12.8
			Valvular heart	77	25.4

[14] It was possible only in a limited way on the basis of the 1910–1912 occupational data.

Aside from the high ratio for accidents, what stands out above all is the high mortality rate for pneumonia, influenza, and the "all respiratory" group as a whole in relation to the corresponding rates for class I. Contact with cases of these diseases may be partially responsible. The ratios emphasize the highly communicable nature of influenza and pneumonia. Bronchitis is much further down the list, and there is no excess at all in the case of respiratory tuberculosis.

The high rate for accident is a little puzzling, but is perhaps associated with the constant use of the automobile by the physician.

A careful examination of the table summarizing the significantly high rates by occupation, suggests that in many instances the high death rate from all causes is not to be explained by the few diseases showing a significantly high mortality. Sometimes, indeed, no cause stands out at all. This does not necessarily mean that other causes than those given in the table explain the high rate, but rather that there is some excess in these causes, but not sufficient to be significant according to the criterion used. This will be true especially of the smaller occupations.

To bring out such relations, and also because of the convenience in comparing figures proportional to the rates for all occupied and retired males, an additional table is given, with the ratios to the rate for all occupied and retired males for each major cause (the so-called "comparative mortality figures" of the British report). The ratios are of two classes:

(*a*) Those in boldface are used wherever the rate is significantly high, or in other words, in every case where a figure was used in the preceding table:

(*b*) All other ratios for the occupations used in the preceding table based on 10 or more deaths. The limitation as to number of deaths was necessary to avoid too much meaningless fluctuation of the ratios.

TABLE 22.—*Ratio of standardized rates for specific occupations to that for all occupied and retired males, by major cause, where rate is above average based on 10 deaths or more, males, aged 20–65, 1921–1923, England and Wales*

Occupation group No.	Occupation	All causes	Respiratory tuberculosis	Bronchitis	Pneumonia	Influenza	Valvular heart	"Other heart"	Cerebral hemorrhage	Digestive diseases	Chronic nephritis	Cancer (all sites)
13a	Tin and copper, underground (III)	433	1,261	500	-----	-----	-----	324	381	-----	-----	189
40a	Grinders, cutlery trade (IV)	329	788	728	244	-----	-----	283	-----	-----	-----	194
13	Tin and copper (III)	327	885	389	-----	-----	-----	224	296	-----	-----	140
40	Metal grinders (IV)	196	426	315	189	163	106	179	151	109	102	150
153	Barmen (IV)	195	269	200	191	137	202	179	187	231	267	179
38	File cutters (III)	185	244	-----	-----	-----	-----	-----	-----	-----	623	-----
20	Earthenware, china, etc. (III)	183	224	489	166	-----	-----	212	-----	-----	-----	156
127	Costermongers, hawkers, etc. (V)	166	229	269	198	109	146	166	102	127	150	121
18	Potters, mill workers, etc. (III)	164	275	548	124	120	150	102	112	188	178	85
118	Stevedores, (IV)	162	223	205	243	-----	147	109	77	151	-----	147
53	Cotton card and frame tenters (IV)	160	106	-----	218	-----	217	187	267	-----	-----	142
95	Slate masons and slate workers (III)	160	343	-----	-----	-----	199	264	-----	-----	-----	109

Table 22.—*Ratio of standardized rates for specific operations to that for all occupied and retired males, by major cause, where rate is above average based on 10 deaths or more, males, aged 20–65, 1921–1923, England and Wales*—Continued

Occupation group No.	Occupation	All causes	Respiratory tuberculosis	Bronchitis	Pneumonia	Influenza	Valvular heart	"Other heart"	Cerebral hemorrhage	Digestive diseases	Chronic nephritis	Cancer (all sites)
152	Inn, hotel keepers, publicans (II)	159	134	85	161	155	133	181	177	345	226	127
120	Other dock laborers (V)	153	190	251	201	116	136	132	123	133	117	142
30	Brass foundry (IV)	153	212	199	249	-----	-----	152	206	-----	-----	106
51	Cotton blow-room operatives (IV)	152	75	302	228	-----	-----	-----	-----	-----	-----	109
75	Cellarmen (IV)	151	158	188	95	186	123	203	-----	186	193	180
122	Porters (V)	150	180	217	179	131	142	165	110	148	99	156
41	Metal glazers, polishers, etc. (IV)	144	212	196	203	192	97	173	137	110	-----	-----
164	General and undefined laborers (V)	144	165	195	169	133	150	127	126	117	127	138
160a	Warehousemen (textiles and clothing) (III)	142	205	116	135	149	117	104	137	185	127	150
24	Other skilled glassworkers (III)	142	181	250	172	180	93	88	180	-----	163	140
19	Pottery dippers, glazers, etc. (III)	141	146	-----	-----	-----	-----	211	-----	-----	-----	152
55	Cotton strippers, grinders, etc. (IV)	140	80	558	159	212	206	125	-----	-----	-----	86
68	Hat formers, plankers, etc. (III)	140	173	-----	132	95	137	232	153	-----	-----	162
94	Masons, cutters and dressers (III)	139	203	199	107	119	125	123	131	111	119	114
112	Drivers of horse-drawn vehicles (IV)	138	132	204	160	127	135	132	132	124	131	143
54	Wool, card or frame tenters (IV)	137	159	218	140	-----	132	98	142	162	181	91
103	Shipyard laborers, etc. (V)	135	160	246	195	181	145	85	108	97	106	125
74	Brewers of ale, stout, porter (IV)	135	-----	-----	-----	-----	-----	-----	-----	313	-----	140
148	Actors (III)	134	153	-----	88	-----	107	116	118	220	175	128
154	Waiters (III)	132	162	97	149	-----	105	77	-----	129	-----	200
101	Drafters and brush makers (III)	132	238	254	135	-----	-----	-----	-----	-----	-----	96
23a	Glass blowers, finishers (III)	131	152	322	95	-----	-----	-----	-----	-----	-----	151
64	Dye mixers and dyers (IV)	130	122	200	134	179	146	138	110	141	140	110
35	Brass finishers and turners (III)	129	206	177	154	159	95	70	111	113	110	145
117	Bargemen and boatmen (IV)	129	113	134	121	168	140	128	137	71	118	124
104	Gas stokers (IV)	129	108	212	159	175	123	103	86	117	127	160
37	Cutlers (III)	128	225	-----	156	-----	-----	-----	-----	-----	-----	113
124a	Salesmen, fish, meat, etc. (III)	128	113	175	123	117	145	161	150	111	150	122
27a	Puddlers (III)	125	90	269	204	-----	-----	-----	139	-----	-----	160
56	Cotton spinners and piecers (III)	125	107	143	118	106	149	128	142	129	149	165
23	Skilled glasshouse workers (III)	124	144	205	99	117	125	89	133	71	-----	131
22	Other persons in manufacture of bricks, etc. (V)	124	107	264	115	135	125	122	121	127	110	169
58	Cotton doublers, winders, etc. (III)	124	87	196	145	133	147	155	131	102	116	125
156	Hairdressers, etc. (III)	123	145	103	111	42	101	134	166	131	193	106
119	Coal-boat loaders and dischargers (V)	123	102	198	196	159	121	131	98	-----	117	186
80	French polishers (III)	123	164	149	118	-----	92	119	118	116	128	126
10	Coal mine, workers below ground (IV)	123	92	167	134	176	124	102	111	106	88	97
50	Wool sorters (III)	123	107	-----	-----	-----	-----	-----	-----	-----	-----	73
149	Musicians (III)	122	139	120	127	-----	131	142	78	128	108	151
8	Coal mine, persons conveying matter to the shaft (IV)	120	77	155	101	133	126	110	129	116	75	81
121	Messengers, hall porters, etc. (V)	120	162	94	130	103	101	112	85	118	77	116
52	Rag grinders, wool willowers, etc. (IV)	120	109	157	-----	-----	-----	165	218	-----	224	123
9	Coal mine, persons making and repairing roads (IV)	119	89	142	115	167	117	95	137	103	77	107
11	Coal mine, workers above ground (IV)	118	98	178	121	172	164	109	140	92	98	88
123a	Proprietors, fish, meat, etc. (II)	117	92	97	122	119	124	164	128	138	161	107
137	Barristers (I)	117	-----	-----	97	-----	-----	251	-----	479	-----	122
66	Cutters of textile goods and clothing (III)	117	188	102	120	-----	120	103	142	101	147	103
76	Tobacco factory operatives (III)	115	200	-----	85	-----	148	-----	-----	147	-----	124
28	Metal molders (III)	114	107	172	171	141	95	102	125	100	107	124
157	Chimney sweeps (III)	112	161	137	107	-----	149	143	-----	86	-----	154
71	Skilled boot and shoe, not clickers, cutters (III)	112	182	106	99	77	121	107	117	110	86	96
29	Iron-foundry furnacemen, laborers (IV)	112	101	182	227	179	106	87	82	62	140	105
48	Skilled lime and tanyard workers, etc. (III)	111	151	97	133	104	108	90	71	134	85	121
125	Commercial travelers (II)	111	101	59	98	89	114	124	111	141	117	123
70	Boot and shoe clickers and cutters (III)	110	182	102	69	81	125	135	146	85	114	105
57	Wool and worsted spinners and piecers (III)	110	90	-----	101	-----	119	127	141	125	290	128
88	Bookbinders and pattern card makers (III)	110	121	102	94	-----	139	76	-----	127	-----	151
162	Packers (IV)	110	133	140	123	85	94	96	91	113	109	190
142	Music teachers (II)	110	93	-----	163	-----	137	87	153	-----	-----	97

By way of interpretation of this table and also to describe briefly occupations which appear frequently in the previous tables, the following summary by occupation is provided. The text of the registrar general's report is drawn upon freely in discussing each occupation.

Tin and copper miners.—Such miners are found exclusively in Cornwall. There is some transfer between these fields and the Transvaal, so that some of the high mortality may be the result of working outside of England. In addition, the tin and copper mines were in a depressed condition in 1921, so that it is probable that most of the able-bodied men had left the mines. As stated before, it is now possible to separate the group of underground workers (13a) from the others and reveal the severity of the hazard. The high rates are found particularly in the case of respiratory tuberculosis, bronchitis, other heart diseases, cerebral hemorrhage, and cancer.

Metal grinders.—Again here it has been possible to separate the group with the greatest hazard (cutlery grinders) from the others. The high mortality for tuberculosis, bronchitis, pneumonia, other heart disease, and cancer in the total group is primarily due to that among cutlery grinders who form one-fifth of the total.

Publicans, barmen, waiters.—Barmen and publicans (including inn and hotel keepers) form a group with excessive mortality from nearly every cause. The distinctive feature of this mortality is perhaps that from cirrhosis of the liver (which is not given in the table), because of its clear indication of the effect of alcoholic intemperance. Except for occupations with known specific hazards, the occupation of barmen stands at the top. Of the diseases in the list, influenza is the only one which is not significantly above the rate for all occupied. Publicans are not much lower, and in that case every disease is significantly above all occupied except bronchitis. This is of particular importance, since this group is in class II, where the rates are usually lower than for all occupied. Waiters have been included for convenience, but they exhibit a much lower rate of mortality, the excess being confined to respiratory tuberculosis, pneumonia, and cancer.

File cutters.—Although a very small occupational group, these workers have been kept separate because of a very high mortality. Rapid change is believed to be in progress in the processes of manufacture, which appears to be reducing the risk for the occupations. For all causes the ratio to all occupied was 185 for 1921–1923. The rate for chronic nephritis was the highest of any occupational group, the ratio being 623. Only one other cause showed a significantly high rate—respiratory tuberculosis—the deaths from other causes being too small for analysis separately.

Makers of bricks and pottery.—These occupations may be combined for convenience, but include some where the conditions are not unfavorable and some where specific hazards exist. Some discussion of the occupations has already been given (p. 1595). The kiln and oven men and the potters have the highest rates. In both of these occupations the ratios are higher for bronchitis (489 and 543, respectively) than for any other major causes, and respiratory tuberculosis ranks next higher. "Other" heart condition is significantly high for kiln and oven men. Pottery dippers and glazers have a high ratio from all causes of 141, which may be explained by the rates for respiratory tuberculosis, "other" heart, and cancer; although in no case can these rates be shown to be significantly greater than those for all occupied. "Other" persons in the manufacture of bricks, etc., have a mortality ratio for bronchitis of 264, no other ratio being definitely significant.

Costermongers.—Costermongers are itinerant vendors of goods, working on their own behalf, instead of for employers, like the canvassers. Their high mortality rates are no doubt to be explained partly by reason of excessive alcoholism (the rates for cirrhosis of the liver are excessive), partly by reason of the physical type going into the occupation, partly, possibly, by reason of the severe weather conditions that the group is exposed to. The rates are high for respiratory tuberculosis, bronchitis, pneumonia, "other" heart, and chronic nephritis. Bronchitis shows the highest ratio. From other causes there seems to be little excess (influenza gives a ratio of 109, cerebral hemorrhage of 102, cancer of 121, digestive of 127). Thus the group stands out from those showing a consistent excess from every important cause.

Dock laborers.—In this group stevedores and coal-boat loaders and dischargers have been tabulated separately. The latter have much lower mortality rates than the dock laborers as a whole (the ratio being 123, while that of stevedores is 162, and of "other" dock laborers, 153), and are too small a group for any particular study of individual causes of death. Bronchitis and pneumonia are highest. Stevedores also comprise a small group; but in spite of this fact we find significantly high rates for respiratory tuberculosis and pneumonia, with a rate for bronchitis which is more than twice that of all occupied (though not quite three times the probable error). "Other" dock laborers comprise a large enough group for more precise comparison. The death rates are significantly high for respiratory tuberculosis, bronchitis, pneumonia, digestive, and cancer. It should be added that in the case of stevedores comparison is made with all occupied, because the group does not fall in social class V, but in the case of coal loaders and "other" dock laborers the test of statistical significance is made with Class V. One can hardly avoid the im-

pression that the exposure of these men to inclement weather has something to do with the very marked excess of mortality from respiratory conditions.

Cotton workers.—Different occupations among cotton workers have already received some consideration in relation to bronchitis and respiratory diseases in general. The group deserves careful study with a detail that is not possible in this paper. Both dust and high temperature and humidity are occupational hazards, but there are suggestions in the data that selection of an inferior type physically and other factors may be of great importance in determining the death rates. The same factors appear to have major influence in the cotton industry in the United States. The disease which stands out most prominently is bronchitis, with a ratio of 558 for strippers and grinders; 302 for blow-room operatives; 196 for doublers, winders, etc.; 143 for spinners and piecers. It is noteworthy that there is no excess for respiratory tuberculosis in any of the specific occupations. Owing to the small numbers in the groups (except spinners and doublers), it is difficult to reach a conclusion as to other causes of death; but ratios are almost invariably above 100. Spinners show a general excess from nearly every cause, no one disease predominating; so in lesser degree with doublers. Weavers are not included in the table, as the rate for all causes was not 10 per cent in excess of the corresponding rate for all occupied.

Masons, stonecutters, and dressers.—The workers of one specific occupation may be considered first, slate masons and workers, who have a very high mortality rate, primarily from respiratory tuberculosis, for which the ratio is 343. The relation to silica dust is established for this occupation. The group is a small one, limited to one district of North Wales.

Although masons, stonecutters, and dressers have been grouped together, whether working in limestone or sandstone, it is clear that a differentiation between the two is necessary if the data are to have much meaning. It will be recalled that such a separation was made in the table on chronic interstitial pneumonia. For the whole group a significant excess is found for respiratory tuberculosis and pneumonia, the other rates being close to the normal. From all causes, sandstone masons show a ratio of 207 and limestone masons a ratio of 120.

Brass foundry.—Brass foundry furnace men and laborers are subject both to the heat risk of foundries in general and to the special risk associated with molten brass. The significantly high rates in this group are from respiratory tuberculosis and pneumonia; but those from bronchitis (199) and cerebral hemorrhage (206) are also suggestive. The ratio for all causes is 153.

Brass finishers and turners may be mentioned here, although they work in cold metal. Significantly high rates are found from respira-

tory tuberculosis, bronchitis, pneumonia, and cancer; but the ratio for all causes is much less (129) than that for the furnace men. Exposure to dust during processes of sand grinding and polishing may contribute to the mortality among finishers.

Porters.—Porters are classified in social class V, but have rates significantly above those for that class from respiratory tuberculosis, bronchitis, pneumonia, "other" heart, digestive, and cancer. The group is no doubt affected to a considerable extent by alcoholism, and shows excessive rates for cirrhosis of the liver.

Messengers, hall porters, etc., are chiefly boys under 20 years of age, and therefore the standardized figure for them is somewhat dubious. Nothing stands out as significant. The majority are classified in social class V, and thus the ratio for all causes (120) conforms to that of their social class.

Metal polishers.—As polishing may be looked upon as a modified form of grinding, so the mortality of polishers presents similar features to that of grinders in a somewhat lesser degree. The rates are significantly high for respiratory tuberculosis, bronchitis, and "other" heart. The pneumonia and influenza rates may also be of importance.

General and undefined laborers.—High mortality is natural to this group, for ill health, misfortune, and unreliability of character must all combine to recruit its ranks. The rates are significantly above social class V for every cause of death in the list, but because of the large numbers in the group only a small excess is needed to show a significant difference. The diseases, in the order of the ratios, are as follows: Bronchitis, pneumonia, respiratory tuberculosis, valvular heart, cancer, influenza, chronic nephritis, "other" heart, cerebral hemorrhage, digestive.

Warehousemen (textiles and clothing).—Warehousemen in general do not have much excess mortality, but those in textiles and clothing have an excess for all causes of 42 per cent, with significantly high rates from respiratory tuberculosis, digestive, and cancer.

Skilled glass workers.—The three groups in which glass workers are divided are meant to include all workers who can be assumed to be subject to the intense heat of the glasshouse—skilled glasshouse workers (Group 23); one special subdivision of these, glass blowers by the traditional method (Group 23a); and other skilled glassworkers, who work mainly in cold glass (engravers, cutters, bevelers, optical workers, etc.) (Group 24). The ratios which are significantly high for these three groups are as follows:

Group 24, respiratory tuberculosis (181), bronchitis (250), pneumonia (172).

Group 23, respiratory tuberculosis (144), bronchitis (265).

Group 23a, bronchitis (322).

The registrar general records as remarkable the high mortality from diabetes among glassworkers (a disease which has not been included in this review). All three of these groups are near the top, 23a and 23 being first and second, respectively. However, the only rate of the three which is significantly high as judged by the probable error is that for skilled glasshouse workers.[15]

Hat formers, plankers, stiffeners.—Two rates are significantly high (respiratory tuberculosis and "other" heart). For cancer, the ratio is 162, but the difference between the rate and that for all occupied is not three times the probable error. There were four deaths.

Drivers of horse-drawn vehicles.—These are almost all engaged in the transportation of goods. The "coachman" of former days has practically disappeared. The rates are significantly above all occupied for every cause considered in this paper, the highest ratio being that for bronchitis. What is of particular interest is that motor drivers do not show any general excess at all. It may be difficult to assign definite reasons for the consistently high rates among drivers of horse-drawn vehicles. Certain it is that no specific hazards exist, unless we regard inclement weather as such. It is hard to escape from the conclusion that a selective process, aided by the fact that the occupation is to be regarded as gradually being replaced by that of motor drivers, has been at work, leaving a group inferior physically.

Wool industry.—Wool, card or frame, tenters have a ratio for all causes of 137. The rate for respiratory tuberculosis is significantly high. That for bronchitis, although not significant according to the criterion used, gives a ratio of 218. Wool sorters and rag winders and wool willowers appear near the bottom of the table, and in neither is any individual ratio significantly high. Wool and worsted spinners and piecers, although with a low ratio for all causes, have a significant ratio of 290 for chronic nephritis.

Shipyard laborers.—This group comprises all the unskilled workers in shipbuilding who could not be assigned as unskilled workers in the metal-working, woodworking, or painting sections. The group falls in social class V, and the rates for no apparent cause are significantly above the corresponding rates for that class.

Actors.—Respiratory tuberculosis and digestive diseases have significantly high rates for this occupation. Cirrhosis of the liver (not given in the table) indicates the effect of alcoholism in this group.

To save space, this description of occupations will not be carried down to those with only slight excess above the rates for all occupied. Some hazards are no doubt present in a few of these occupations, and it is not meant to imply that there is not a great deal of information

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[15] Group 23a has a mortality rate of 42 4 $\pm$ 11 3, Group 24, 28.7 $\pm$ 7.6. All occupied is 11.2.

of interest in this part of the table; but space forbids any detailed consideration.

VI. Mortality by Age from a Few Causes

For purposes of any extended analysis, perhaps the most valuable portion of the registrar general's report lies in the "abstracts" giving the deaths and the death rates by age, cause, and occupation. From such sources it is difficult to identify hazards in small occupational groups, as noted above; but the material is immensely valuable as reflecting the effect of industry on the health of the workers in a general sense, and the different ways in which this influence is felt in specific diseases. It is not possible here to more than touch upon some of the points of greatest interest. Because of the unique position occupied by respiratory tuberculosis, that cause of death has been selected for special study, but tabular data are also given for a number of other diseases.

TUBERCULOSIS

The extraordinary decline in mortality from tuberculosis in recent years might suggest that this disease had ceased to be of fundamental importance in industry, but, as the preceding tables have shown, this is not at all true. A series of graphs are given, in which the age curve of respiratory tuberculosis for a number of occupations is contrasted with that for all occupied and retired males. Quite obviously, only occupations of considerable size could be used, since in other cases the rates by age would fluctuate widely. Hence the graphs can not be taken as a complete picture of occupations with excessive death rates from respiratory tuberculosis. For such a picture it is necessary to turn back to Table 7. In the case of occupations in class V, it has been found well to include the curve for that social class. The rates in class III and class IV were so nearly the same that it seemed preferable, generally, to use the curve for all occupied and retired males. At the end of the series of graphs is given also the curve for farmers. The occupations are arrayed according to the magnitude of the death rate. For the first graph a scale one-fourth that used in succeeding graphs was deemed necessary. The reader must bear in mind that many abrupt changes and irregular fluctuations in the curves are due to the small numbers. It will be found difficult to extract any meaning except from the general trends.

Where there is a specific hazard, there is a tendency for the rate to rise steadily with age, quite unlike the rate for occupied males generally. This unique form of curve is noted particularly for tin and copper underground miners; grinders in cutlery trade; slate masons and slate workers; potters' mill workers and potters; cutlers;

masons, stone cutters, and dressers; earthenware, china, etc., kiln and oven men, and kiln setters and placers; slate miners and quarriers. One is impressed here by the unique position held by dust, particularly dust with a high percentage of free silica.

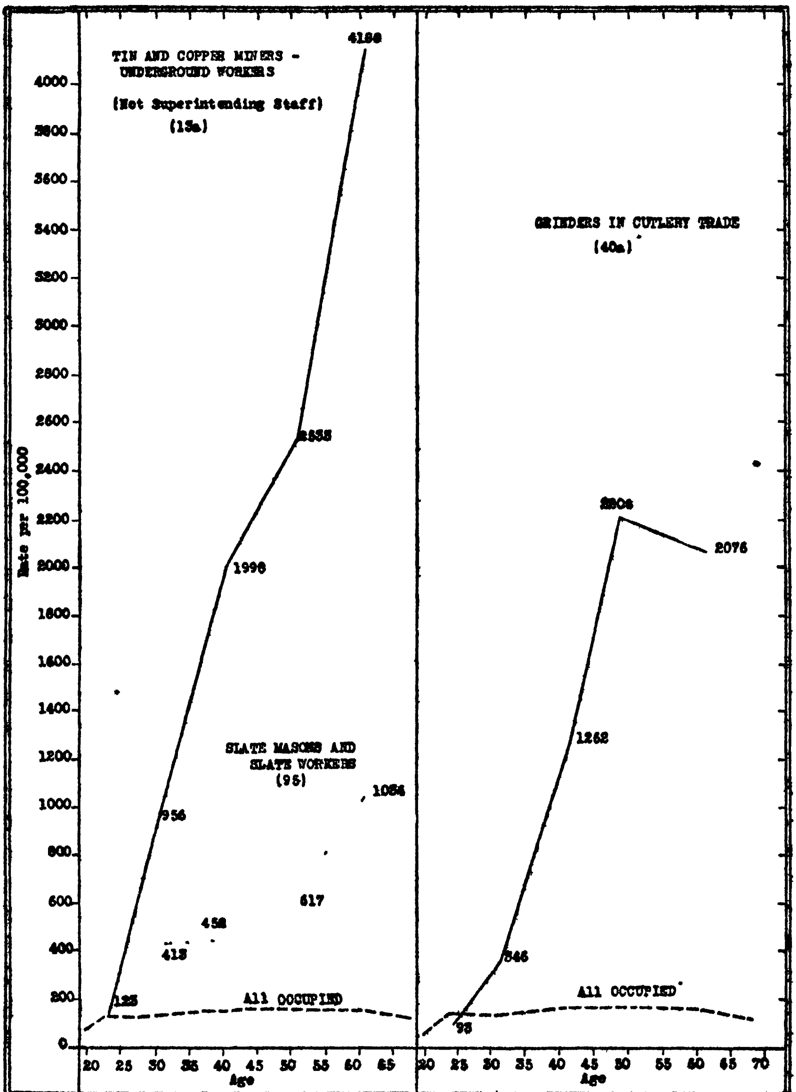

FIG 1 —Mortality rates for respiratory tuberculosis for males in specified occupations and for all occupied and retired civilian males, by age, England and Wales, 1921–1923

But in many other occupations where dust is not a factor, abnormally high mortality rates from respiratory tuberculosis are found. The shape of the curve in these occupations has a tendency more or less to follow that of the curve for all occupied, but important

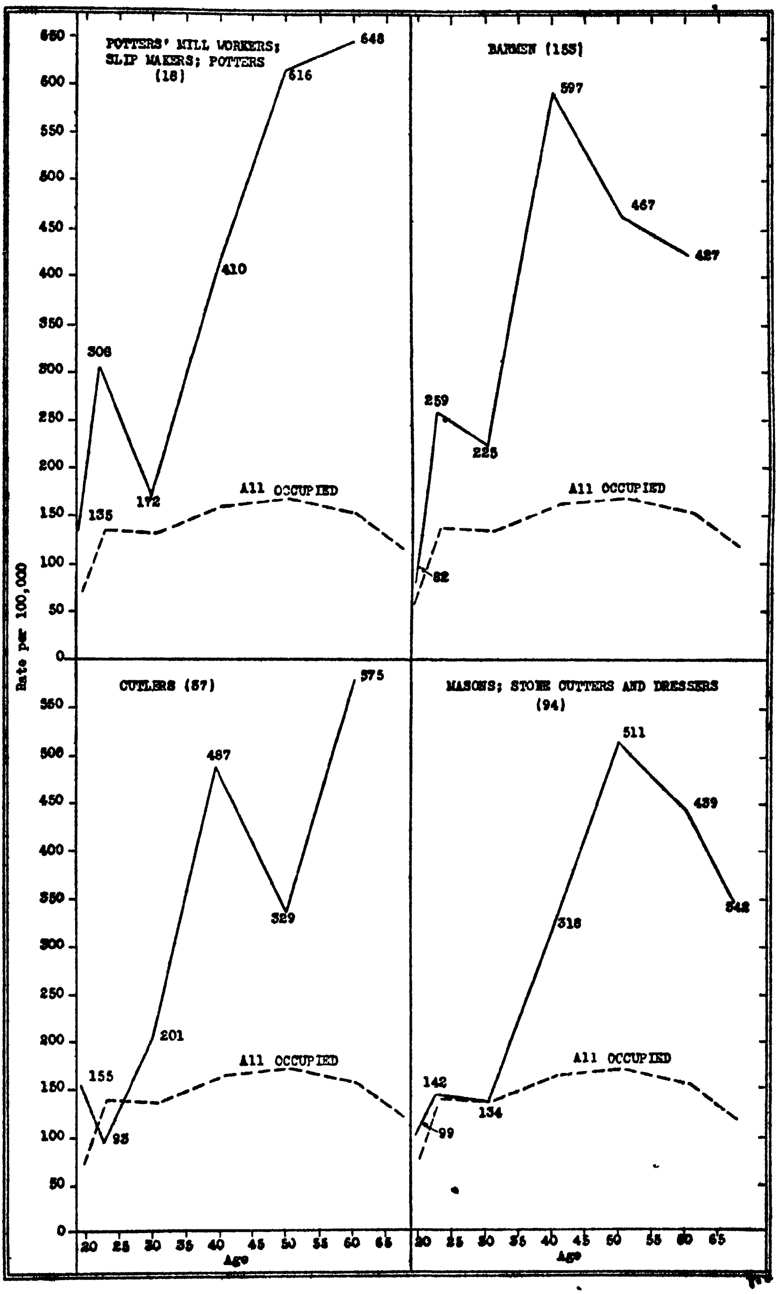

FIG 2.—Mortality rates for respiratory tuberculosis for males in specified occupations and for all occupied and retired civilian males, by age, England and Wales, 1921–1923

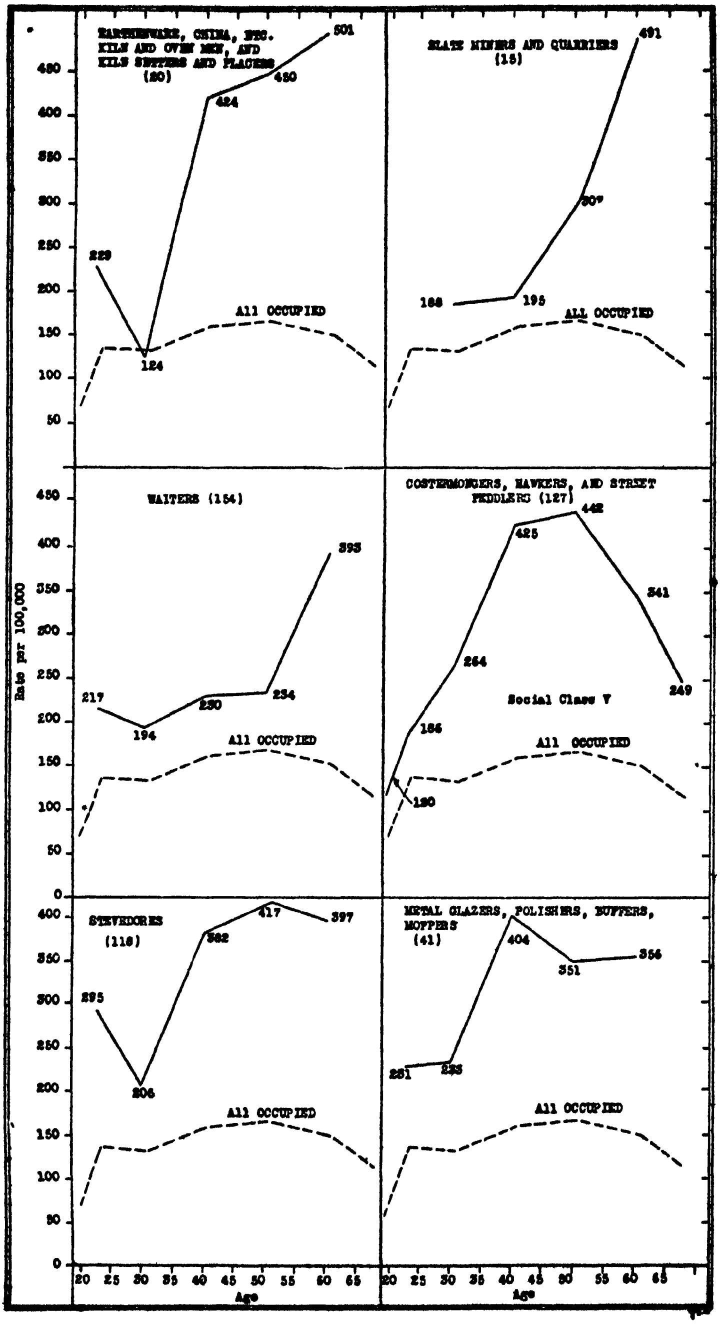

FIG 3 —Mortality rates for respiratory tuberculosis for males in specified occupations and for all occupied and retired civilian males, by age, England and Wales, 1921-1923

differences are manifested. In some occupations the death rate appears to be higher than the average from the beginning of life on, suggesting a selective factor in the type of worker rather than the

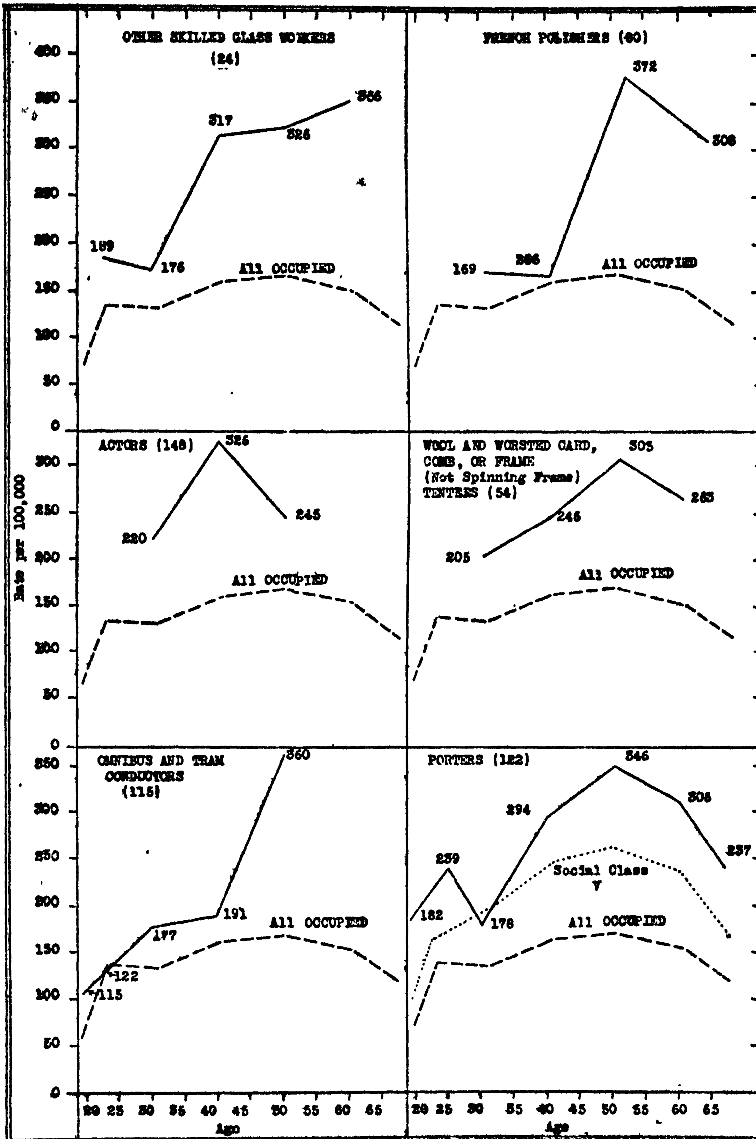

FIG. 4.—Mortality rates for respiratory tuberculosis for males in specified occupations and for all occupied and retired civilian males, by age, England and Wales, 1921–1923

effect of any hazard. In other cases the curve is no higher at the beginning of life, but reaches a peak later, and then gradually declines. One feels that in some occupations there are reflected such indirect

hazards as the strain of the industry or possibly exposure; in others that "the conditions of life implied by various occupations," as the registrar general puts it, appear to be of greatest importance. This

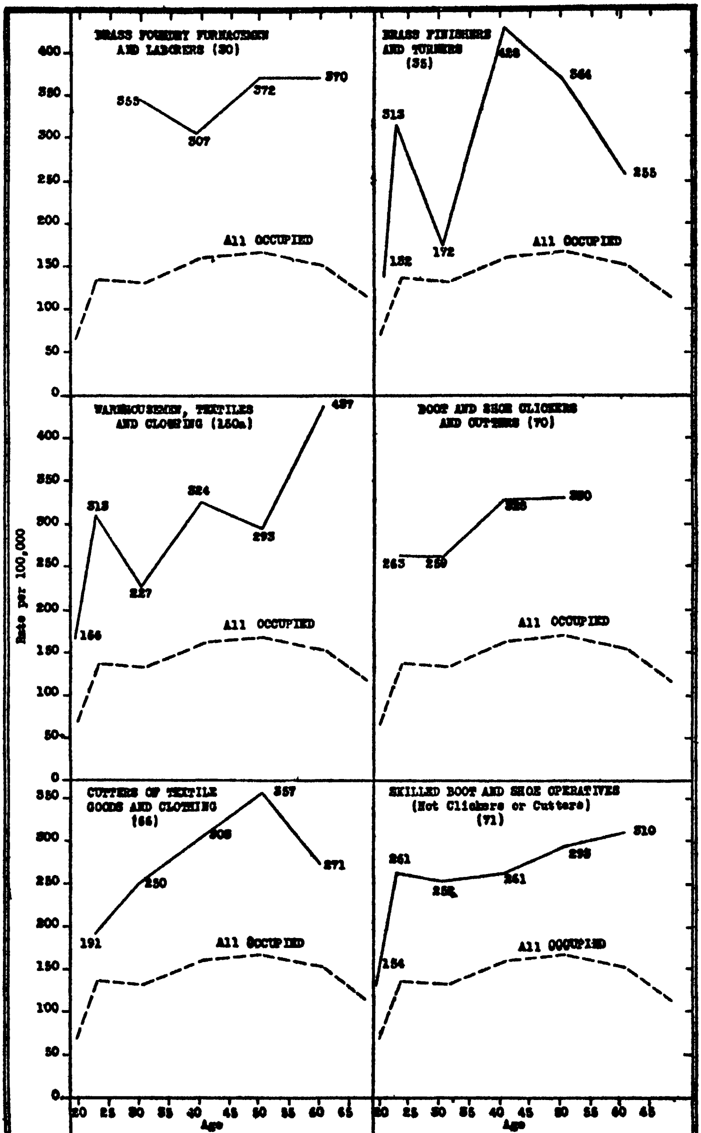

FIG 5 —Mortality rates for respiratory tuberculosis for males in specified occupations and for all occupied and retired civilian males, by age, England and Wales, 1921-1923

series of graphs suggests the need for an adequate study as to the causes of the high tuberculosis mortality in industry, apart from specific hazards.

OTHER MAJOR CAUSES OF DEATH

Respiratory tuberculosis lends itself peculiarly well to a comparison by age. Other major causes of death have relatively little mortality

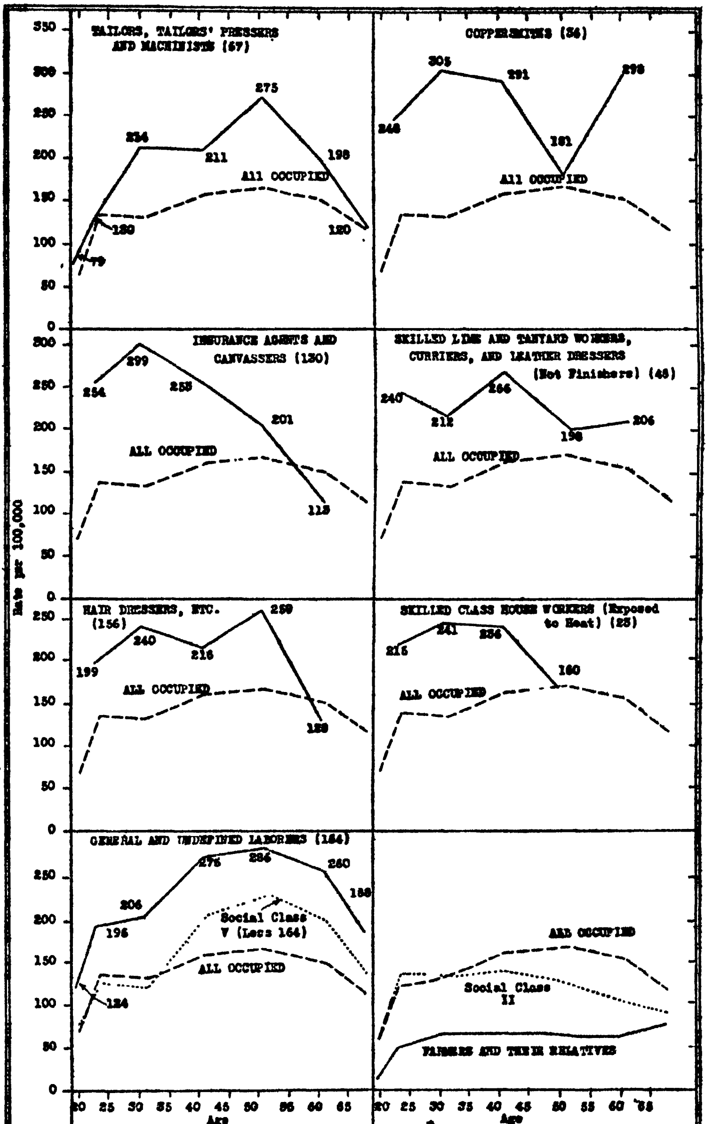

FIG. 6.—Mortality rates for respiratory tuberculosis for males in specified occupations and for all occupied and retired civilian males, by age, England and Wales, 1921–1923.

in the younger ages. Accordingly, a graph would fail to bring out important differences at these ages, because such differences would be overshadowed by the height of the curve in advanced age. Tables

of the rates themselves, with ratios to the rate for all occupied in the same age group, seem to give a better idea of the influence of occupation. Such tables have been prepared for the following diseases: Bronchitis, pneumonia, valvular heart disease, other heart disease, cerebral hemorrhage, chronic nephritis, and cancer. Except in the case of pneumonia, satisfactory rates can be obtained only for three age groups, 35–44, 45–54, and 55–64. Rates for the lower ages are usually based on too small a number of deaths for satisfactory interpretation; rates for the ages beyond active industrial life, as in previous tables, do not seem to have any definite meaning with respect to occupational differences. Only occupations with significantly high rates and with large enough populations to permit fairly stable curves by age are included. The standardized rates and the rates for the three age groups are given at the top of the table, followed by corresponding ratios to the rate among all occupied and retired males. Blanks are left where the number of deaths is quite small. Such comment as seems necessary is given at the end of the whole group of tables.

TABLE 23.—*Mortality by age from bronchitis in occupations with excessive*[1] *rates, including ratio to rate among all occupied and retired males*

	Standardized rate	Age group		
		35–44	45–54	55–64
RATE PER 100,000				
All occupied and retired males	45	20	56	191
Social class I	12	5	17	47
Social class III	43	16	50	189
Social class V	80	41	109	313
13a. Tin and copper mines, underground workers (III)	227			1,173
55. Cotton strippers and grinders, card-room jobbers (IV)	253		294	1,250
18. Potters' mill workers, slip makers, etc (III)	247		205	1,327
20. Earthenware, china, etc., kiln and oven men (III)	222		309	1,001
40. Metal grinders (IV)	143		224	607
23. Skilled glasshouse workers (III)	120	59	214	432
23a. Glass blowers and finishers (not machine hands) (III)	146		243	575
13. Tin and copper mines (not superintending staff) (III)	176			877
127. Costermongers, hawkers, and street sellers (V)	122	54	175	488
22. Others in manufacture of bricks, tiles, pottery (V)	120	58	154	472
120. Other dock laborers (V)	114	52	160	448
112. Drivers of horse-drawn vehicles (IV)	93	42	125	363
164. General and undefined laborers (V)	88	47	121	337
122. Porters (V)	99	64	129	352
RATIO TO ALL OCCUPIED AND RETIRED MALES				
13a. Tin and copper mines, underground workers (III)	504			614
55. Cotton strippers and grinders, card-room jobbers (IV)	562		525	654
18. Potters' mill workers; slip makers, etc. (III)	549		366	695
20. Earthenware, china, etc., kiln and oven men (III)	493		552	524
40. Metal grinders (IV)	318		400	318
23. Skilled glasshouse workers (III)	267	295	382	226
23a. Glass blowers and finishers (not machine hands) (III)	324		434	301
13. Tin and copper mines (not superintending staff) (III)	391			459
127. Costermongers, hawkers, and street sellers (V)	271	270	312	255
22. Others in manufacture of bricks, tiles, pottery (V)	267	290	275	247
120. Other dock laborers (V)	253	260	286	235
112. Drivers of horse-drawn vehicles (IV)	207	210	223	190
164. General and undefined laborers (V)	196	235	216	176
122. Porters (V)	220	320	230	184

[1] Where numbers are sufficient for specific rates.

Table 24.—*Mortality by age from pneumonia in occupations with excessive*[1] *rates, including ratio to rate among all occupied and retired males*

	Standardized rate	Age group			
		25–34	35–44	45–54	55–64
RATE PER 100,000					
All occupied and retired males	78	40	72	103	179
Social class I	65	26	63	93	144
Social class III	70	37	63	91	158
Social class V	117	61	111	154	251
29. Iron foundry furnacemen and laborers (IV)	177	116	158	217	336
120. Other dock laborers (V)	156	71	155	199	345
127. Costermongers, hawkers, street sellers (V)	154	78	163	217	295
40. Metal grinders (IV)	147	54	101	206	320
122. Porters (V)	139	90	143	171	299
28. Metal molders (III)	133	67	134	155	321
164. General and undefined laborers (V)	131	65	120	173	297
152. Inn, hotel keepers, publicans (II)	125	69	157	166	237
112. Drivers of horse-drawn vehicles (IV)	124	71	121	173	242
27. Persons engaged in smelting, rolling, etc. (IV)	118	68	121	123	258
154. Waiters (III)	116	-------	103	203	309
10. Coal mines, other workers below ground (IV)	105	51	80	156	212
44. Tinsmith and sheet metal workers (III)	104	44	80	178	217
116. Grooms and horse keepers (IV)	101	55	101	128	249
124a. Salesmen, etc., of fish, meat, etc. (III)	96	44	86	144	206
162 Packers (IV)	96	42	116	136	152
123a. Proprietors for sale of fish, meat, etc. (II)	95	64	97	115	197
11. Coal mines, above ground, not superintending staff (IV)	95	42	87	122	217
RATIO TO ALL OCCUPIED AND RETIRED MALES					
29. Iron foundry furnacemen and laborers (IV)	227	290	219	211	188
120. Other dock laborers (V)	200	178	215	193	193
127. Costermongers, hawkers, street sellers (V)	197	195	226	211	174
40. Metal grinders (IV)	188	135	140	258	188
122. Porters (V)	178	225	199	166	176
28. Metal molders (III)	171	168	186	150	189
164. General and undefined laborers (V)	168	163	167	168	175
152. Inn, hotel keepers, publicans (II)	160	173	218	161	139
112. Drivers of horse-drawn vehicles (IV)	159	178	168	168	142
27. Persons engaged in smelting, rolling, etc. (IV)	151	170	168	119	152
154. Waiters (III)	149	-------	143	197	182
10. Coal mines, other workers below ground (IV)	135	128	111	151	125
44. Tinsmith and sheet metal workers (III)	133	110	111	173	128
116. Grooms and horse keepers (IV)	129	138	140	124	146
124a. Salesmen, etc., of fish, meat, etc. (III)	123	110	119	140	121
162. Packers (IV)	123	105	161	132	89
123a. Proprietors for sale of fish, meat, etc. (II)	122	160	135	112	116
11. Coal mines, above ground, not superintending staff (IV)	122	105	121	118	123

[1] Where numbers are sufficient for specific rates.

TABLE 25.—*Mortality by age from valvular disease of the heart in occupations with excessive* [1] *rates, including ratio to rate among all occupied and retired males*

	Standardized rate	Age group 35-44	45-54	55-64
RATE PER 100,000				
All occupied and retired males	58	36	72	188
Social class I	33	17	35	135
Social class III	56	34	69	184
Social class V	74	50	95	217
153. Barmen (IV)	117	62	110	512
11. Coal mines, above ground, not superintending (IV)	95	46	133	280
164. General and undefined laborers (V)	87	59	115	247
124a. Salesmen, fish, meat, greengrocery, etc (III)	84	46	121	262
56. Cotton spinners and piecers (III)	87	35	83	287
64. Dye mixers and dyers (IV)	85	......	81	299
60. Cotton weavers (III)	82	52	84	291
112. Drivers of horse-drawn vehicles (IV)	79	57	93	210
152. Inn, hotel keepers, publicans (II)	77	57	107	247
8 Coal mines, persons conveying material to the shaft (IV)	75	61	79	258
163. Stationary engine and crane drivers (III)	73	38	90	267
123a Proprietors, etc, fish, meat, greengrocery, etc. (II)	72	45	93	222
10. Coal mines, other workers below ground (IV)	72	41	93	221
160. Warehousemen (III)	71	53	79	212
98. Painters and decorators (III)	66	47	88	186
RATIO TO ALL OCCUPIED AND RETIRED MALES				
153. Barmen (IV)	202	172	153	272
11 Coal mines, above ground, not superintending (IV)	164	128	185	149
164 General and undefined laborers (V)	150	164	160	131
124a Salesmen, fish, meat, greengrocery, etc. (III)	145	128	168	139
56 Cotton spinners and piecers (III)	150	97	115	153
64 Dye mixers and dyers (IV)	147	......	112	159
60. Cotton weavers (III)	141	144	117	155
112. Drivers of horse-drawn vehicles (IV)	136	158	129	112
152 Inn, hotel keepers, publicans (II)	133	158	149	131
8. Coal mines, persons conveying material to the shaft (IV)	129	169	110	137
163. Stationary engine and crane drivers (III)	126	106	125	142
123a Proprietors, etc, fish, meat, greengrocery, etc. (II)	124	125	129	118
10. Coal mines, other workers below ground (IV)	124	114	129	118
160. Warehousemen (III)	122	147	110	113
98. Painters and decorators (III)	114	131	122	99

[1] Where numbers are sufficient for specific rates.

TABLE 26.—*Mortality by age from other heart disease in occupations with excessive* [1] *rates, including ratio to rate among all occupied and retired males*

	Standardized rate	Age group 35-44	45-54	55-64
RATE PER 100,000				
All occupied and retired males	60	30	70	222
Social class I	64	26	77	266
Social class III	54	27	58	210
Social class V	69	41	86	237
152. Inn, hotel keepers, publicans (II)	109	46	161	385
127. Costermongers, hawkers, and street sellers (V)	100	89	144	295
122 Porters (V)	99	54	109	314
123a. Proprietors, etc, fish, meat, greengrocery, etc. (II)	98	41	124	361
124a. Salesmen, fish, meat, greengrocery, milk (III)	96	48	79	420
156. Hairdressers, etc. (III)	80	33	98	326
112. Drivers of horse-drawn vehicles (IV)	79	46	91	279
123. Proprietors, wholesale and retail business (II)	79	37	95	289
67. Tailors, tailors' pressers, and machinists (III)	75	45	86	247
125. Commercial travelers (II)	74	33	73	304

[1] Where numbers are sufficient for specific rates.

TABLE 26.—*Mortality by age from other heart disease in occupations with excessive rates, including ratio to rate among all occupied and retired males*—Continued

	Standardized rate	Age group 35-44	45-54	55-64
RATIO TO ALL OCCUPIED AND RETIRED MALES				
152. Inn, hotel keepers, publicans (II)	182	153	230	173
127. Costermongers, hawkers, and street sellers (V)	167	297	206	138
122. Porters (V)	165	180	156	141
123a. Proprietors, etc., fish, meat, greengrocery, etc. (II)	163	137	177	168
124a. Salesmen, fish, meat, greengrocery, milk (III)	160	160	113	189
156. Hairdressers, etc. (III)	133	110	133	147
112. Drivers of horse-drawn vehicles (IV)	132	153	130	126
123. Proprietors, wholesale and retail business (II)	132	123	136	130
67. Tailors, tailors' pressers, and machinists (III)	125	150	123	111
125. Commercial travelers (II)	123	110	104	137

TABLE 27.—*Mortality by age from cerebral hemorrhage in occupations with excessive*[1] *rates, including ratio to rate among all occupied and retired males*

	Standardized rate	Age group 35-44	45-54	55-64
RATE PER 100,000				
All occupied and retired males	41	11	49	194
Social class I	36	7	45	172
Social class III	41	11	47	196
Social class V	44	15	54	201
152. Inn, hotel keepers, publicans (II)	73	28	125	281
98. Painters and decorators (III)	64	17	92	277
124a. Salesmen, etc., of fish, meat, etc. (III)	62	24	83	254
42. Plumbers (III)	59	12	81	272
60. Cotton weavers (III)	67	-------	63	365
89. Employers, managers in building, etc., trades, etc. (II)	59	20	68	270
56. Cotton spinners and piecers (III)	59	17	55	287
156. Hairdressers, etc. (III)	68	-------	57	361
RATIO TO ALL OCCUPIED AND RETIRED MALES				
152. Inn, hotel keepers, publicans (II)	178	255	255	145
98. Painters and decorators (III)	156	155	188	143
124a. Salesmen, etc., of fish, meat, etc. (III)	151	218	169	131
42. Plumbers (III)	144	109	165	140
60. Cotton weavers (III)	163	-------	120	188
89. Employers, managers in building, etc., trades, etc. (II)	144	182	139	130
56. Cotton spinners and piecers (III)	144	155	112	148
156. Hairdressers, etc. (III)	166	-------	116	186

[1] Where numbers are sufficient for specific rates.

TABLE 28.—*Mortality by age from chronic nephritis in occupations with excessive*[1] *rates, including ratio to rate among all occupied and retired males*

	Standardized rate	Age group 35–44	45–54	55–64
RATE PER 100,000				
All occupied and retired males	32	17	45	108
Social class I	31	18	47	115
Social class III	31	16	41	107
Social class V	34	21	49	106
98. Painters and decorators (III)	60	38	98	190
164. General and undefined laborers (V)	40	26	58	125
123. Proprietors and managers (II)	41	21	56	140
112. Drivers of horse-drawn vehicles (IV)	41	24	54	124
RATIO TO ALL OCCUPIED AND RETIRED MALES				
98. Painters and decorators (III)	188	224	218	176
164. General and undefined laborers (V)	125	153	129	116
123. Proprietors and managers (II)	128	124	124	130
112. Drivers of horse-drawn vehicles (IV)	128	141	120	115

[1] Where numbers are sufficient for specific rates.

TABLE 29.—*Mortality by age from cancer in occupations with excessive*[1] *rates, including ratio to rate among all occupied and retired males*

	Standardized rate	Age group 35–44	45–54	55–64
RATE PER 100,000				
All occupied and retired males	117	40	166	494
Social class I	94	24	146	386
Social class III	116	40	160	495
Social class V	144	51	211	596
154. Waiters (III)	235	46	390	956
56. Cotton spinners and piecers (III)	194	65	268	879
153. Barmen (IV)	210	53	343	826
104. Gas stokers (IV)	188	46	242	801
75. Cellarmen (IV)	212	-------	317	771
40. Metal grinders (IV)	177	-------	266	799
149. Musicians (III)	177	59	230	786
160a. Warehousemen, textiles and clothing (III)	176	-------	321	690
88. Bookbinders and pattern card makers (III)	177	-------	290	697
122. Porters (V)	183	82	282	696
157. Chimney sweeps (III)	[2] 181	-------	318	584
35. Brass finishers and turners (III)	171	94	331	510
112. Drivers of horse-drawn vehicles (IV)	168	57	255	682
120. Other dock laborers (V)	167	48	261	670
164. General and undefined laborers (V)	162	57	233	677
RATIO TO ALL OCCUPIED AND RETIRED MALES				
154. Waiters (III)	201	115	235	193
56. Cotton spinners and piecers (III)	166	163	152	178
153. Barmen (IV)	179	133	207	167
104. Gas stokers (IV)	161	115	146	182
75. Cellarmen (IV)	181	-------	191	156
40. Metal grinders (IV)	151	-------	160	162
149. Musicians (III)	151	125	139	159
160a. Warehousemen, textiles and clothing (III)	150	-------	193	140
88. Bookbinders and pattern card makers (III)	151	-------	175	141
122. Porters (V)	156	205	170	141
157. Chimney sweeps (III)	[2] 155	-------	191	118
35. Brass finishers and turners (III)	146	235	199	103
112. Drivers of horse-drawn vehicles (IV)	144	143	154	138
120. Other dock laborers (V)	143	120	157	136
164. General and undefined laborers (V)	138	143	140	137

[1] Where numbers are sufficient for specific rates.
[2] Difference less than 3 times the probable error.

Occupations with the highest mortality from bronchitis tend to show progressively higher rates as age advances, paralleling what was found in the case of tuberculosis. For instance, potters have a ratio of 366 for age group 45–54 and 695 for age group 55–64. In the case of cotton strippers the two rates are respectively 525 and 654. The other occupations shown in the table, however, do not generally manifest this tendency. The striking differences as to mortality by social class brought out previously is reemphasized at the top of the table.

In the case of pneumonia it appeared that the data for the age group 25–34 was also of value, because of the relatively higher mortality at this age for pneumonia than for the other causes of death included in these tables. Pneumonia is an acute disease, and one would not expect an excessive rise with age even in occupations predisposing to the disease. The ratios suggest that the excess mortality occurs more or less indifferently throughout the ages considered.

The same impression is given by the ratios of valvular and other heart disease, in spite of many irregularities for specific occupations, and the remaining causes of death for which ratios have been calculated. Careful study of these ratios will no doubt reveal some points of real interest in connection with the manner in which industrial hazards and industrial strain reveal themselves in different diseases.

Conclusion

No summary of the rather variegated findings of this paper seems required. Certain specific hazards have been thrown into relief by these figures, hazards which were in most cases understood to exist. In some instances new emphasis has been placed upon them; in others a different evaluation. From the point of view of specific, direct occupational hazard, it seems to the writer that the material is particularly valuable as an aid in checking up the meaning and extent of conditions which an industrial hygienist may encounter in his own work. If some adverse influence is suspected, the British figures may throw light on whether a suspected association between the condition and the occupation itself may be real.

Beyond this realm of direct deleterious influences (which really affect a relatively small group of the working population) we see the subtle and pervasive effect of many indirect conditions, occupational, living, even hereditary. "It will be found," states the registrar general, "that the effect of occupation upon male mortality is probably on the whole more indirect than direct—that mortality is influenced more by the conditions of life implied by various occupations than by the direct occupational risks entailed. The figures for

males do not permit of differentiation between the two types of influence, as both are at work in every case, so no definite proof can be adduced of this suggestion, which merely represents an impression created by study of the facts dealt with."

PUBLIC HEALTH ENGINEERING ABSTRACTS

Contact Infection of Milk Through Bottles. R. Meurer. Ztschr. f. Fleisch-u. Milch-hygiene, 1927, v. 37, 150–153; 169–172. From *Bulletin of Hygiene*, vol. 3, No. 1, January, 1928, pp. 21–22.

"Results of bacteriological examinations show progressive increase in the bacterial content of milk from the time of milking until finally bottled for delivery.

"Two samples tested showed an increase from 97 per cent to 442 per cent in the bacterial content. The large increase took place in the final stage of bottling.

"A completely sterile flask is difficult to obtain, so it is of great importance that preliminary stages in milking should be done with more care."

Sources of contamination: (1) "A large number of bacteria are to be found in water used for rinsing the vessels; (2) the brushes used for cleansing the vessels are potent sources of contamination and a larger increase in the bacterial content occurs in the milk if old brushes are used than with new brushes; (3) * * * 400,000 bacteria per c. c. were found in bottled milk, whereas directly after the cooling process the number was only 5,000 per c. c.; (4) * * * when samples of pasteurized milk were placed in sterile vessels and the ordinary bottles, the bacterial content of the milk in the sterile bottles remained constant, while that of the ordinary bottle varied greatly."

Reducing contamination: (1) "If the bottles are dried at 70° C. (158° F.) for thirty (30) minutes after they have been rinsed, the number of bacteria in the milk is greatly reduced; (2) in order to ensure a low bacterial content, bottles should be filled as soon as possible after sterilization of the milk; (3) * * * placing bottles in inverted position reduces contamination."

Chemical Sterilization in the Dairy Industry. M. J. Prucha. World's Butter Rev. 2, 12–7 (1928). Abstract by F. L. Seymour-Jones in *Chemical Abstracts*, vol. 22, No. 8, April 20, 1928, p. 1414.

"The Cl group of disinfectants is most satisfactory for dairy equipment. Cl in aqueous solution, $Ca(OCl)_2$, NaOCl dry and in solution, and chloramine-T were studied. All solutions were fairly stable up to 60 minutes at 26–71°. The addition of small amounts of milk caused reduction in available Cl, increasing with milk concentration. Adding NaOH increased stability except in the presence of milk, when decomposition was more rapid. Laboratory tests on *B. coli* showed sterilization was satisfactory with Cl and hypochlorites; with chloramine-T greater concentrations of available Cl were necessary. NaOCl gave excellent results in a four-month test in a bottled-milk plant. All utensils and equipment should be washed before sterilization. They are then rinsed with solutions of 50–100 p. p. m. available Cl or sprayed with solutions of 500 p. p. m."

Eliminating Tastes and Odors Caused by Algae in Water. Chester Cohen. *The American City*, vol. 38, No. 4, April, 1928, pp. 129–130. (Abstract by J. B. Harrington.)

Algae in Southern States, where climatic conditions are favorable to their growth, are partly responsible for discoloring the water, for imparting tastes and odors to the water, and for clogging filter beds and filling the pores of the filter material. Their presence is also quite common in swimming pools. Living

algæ produce oils which give the water a fishy, grassy, oily taste. When the food supply becomes exhausted and the algæ die, or when the algæ are killed by treatment, decomposition takes place, producing a strong medicinal taste when chlorine is used.

Algæ may be controlled by covering the reservoir or by treatment of the water with copper sulphate (bluestone) or chlorine. The dosage of either must be determined according to the type of algal growth. Water weeds in large reservoirs are usually destroyed by cutting the tops below the water line or by pulling up the weeds.

The Relation of Turbidity to Coagulant Dosage. Kenneth C. Armstrong. *The American City,* vol. 38, No. 2, February, 1928, pp. 100–102. (Abstract by J. B. Harrington.)

In this paper is described the relation of the turbidity to the coagulant dosage as observed at the Omaha, Nebr., filtration plant. From a series of tests, made by permitting river water to settle in a 5½-foot glass cylinder for various lengths of time and then siphoning off samples for turbidity tests, it was found that the coagulants required could be determined by the results of the three-hour settling tests.

During periods of high turbidity (10,000 p. p. m.) the application of coagulants at two points has been extremely helpful in delivering a satisfactory water to the filters. The effect of various turbidities on the coagulants required and the results of the settling tests are given in detail and shown on various charts of operation for June and July, 1926, and May, 1927.

The following conclusions are given: (1) The suspended material is chiefly responsible for variation in coagulant dosage; (2) coagulant dosage can be determined largely by the results of the 3-hour turbidity test; (3) two-point application of chemicals is helpful in treating very turbid water; (4) the 24-hour turbidity test gives a good indication of the concentration of finely divided material, some of which is of colloidal nature.

The Twort-D'Herelle Phenomenon. R. Bruynoghe. *The Journal of State Medicine,* vol. 35, No. 11, November, 1927, pp. 621–636 (Abstract by C. T. Butterfield.)

The author discusses the subject under the following headings: (1) Historical; (2) means of detecting bacteriophage; (3) the resistance of germs toward bacteriophage influence; (4) the properties of bacteriophages; (5) plurality of bacteriophages—(*a*) reciprocal resistance, (*b*) neutralization of bacteriophages, (*c*) properties of the bacteriophages; (6) the bacteriophage complexity.

The literature related to each type is reviewed briefly. The article is to be continued in subsequent numbers of the *Journal.*

McQueen vs. Owen Sound and Others. Anon. *Canadian Engineer,* vol. 54, No. 1, Jan. 3, 1928, pp. 111–113; No. 2, January 10, 1928, pp. 124–126. (Abstract by R. E. Thompson.)

In the case of McQueen *v.* the City of Owen Sound in 1926 the trial court found that "the plaintiff's illness [typhoid] was caused by the negligent supply to her by the defendants of contaminated water and awarded her damages" [$2,000].

The defendants appealed, and the conclusions of the appeal court are summed up as follows: "First, that there is no direct evidence that the water supplied the plaintiff by the defendants carried typhoid bacilli and that there is no indirect evidence to warrant the inference that it did; therefore it could not have caused her illness. On this ground alone her action fails. Secondly, I am of opinion that even if the water did contain typhoid bacilli the evidence does not warrant the inference that of all possible causes of the plaintiff's illness the most probable one was contaminated water. For this reason also her action fails, and

the judgment should be set aside and the action dismissed with costs below and of the appeal."

It is believed by the appeal court that not sufficient importance was attached to the possibility of contamination carried by flies from neighboring septic tanks, the overflow from which flowed in an open ditch in the vicinity of the plaintiff's residence. The case under consideration was one of a number which occurred in a restricted area. Of 800 pupils attending two schools in the district which was supplied with the same water as the plaintiff, only 3 contracted the disease, and these three pupils resided in the area in which infection from the septic tanks was possible. A previous outbreak in another section of the city may have been caused by fly or air borne infection from sewage sludge recently distributed over an area of land.

Clarification of the Catskill Water Supply of the City of New York by Coagulation and Sedimentation. Wm. W. Brush. *Journal of the New England Water Works Association*, vol. 42, No. 1, March, 1928, pp. 65–78. (Abstract by W. J. Scott.)

In December, 1926, a combination of very low storage-reservoir level with a flood-flow run-off from watersheds containing many steep clay banks raised the turbidity of the Catskill water supply of New York City to such an extent that alum and soda-ash treatment was carried out for nearly six months. The chemicals were applied to water above Kensico Reservoir, having at times a turbidity of over 100 p. p. m., and clarification took place in Kensico Reservoir, where the maximum turbidity of the effluent was 7 p. p. m. Low hydrogen ion figures were recorded until soda-ash application was begun. A noteworthy feature was the rapidity with which the clarification of the turbidity in the untreated water of Ashokan Reservoir took place in the last two weeks of May, 1927, whereas a very long sedimentation period was expected to be necessary for the finely divided clay. Temperature was not the only factor, as higher laboratory temperatures did not bring about this improvement. The treatment is of interest particularly because of the very large volume of water treated.

Coagulation Studies at the Washington Suburban Sanitary District. Robert B. Morse, Carl A. Hechmer, and S. T. Powell. *Industrial and Engineering Chemistry*, vol. 20, No. 1, January, 1928, pp. 56–59. (Abstract by Frank Raab.)

The Washington Suburban Sanitary District receives its water supply from a branch of the Anacostia River. The water is treated at two small rapid sand filter plants, one of which is located in Hyattsville, the other in Burnt Mills. The water has an alkalinity of from 18 to 22 p. p. m. The turbidity, which is subject to sudden changes, ranges from 5 to 5,000 p. p. m. after a rainfall. The water is treated with alum; during periods of high turbiduty soda ash is added to aid in the coagulation. The coagulant is added as the water enters the centrifugal pumps. Lime is added to the filter effluent to bring about a pH of about 8.0. This is necessary to have a pH of 7.0, or a little more, in the distribution system. During high turbidities, when larger doses of alum are required, alum floc passes through the filters, which gives the water in the clear-water reservoir a cloudy appearance.

It was found that small amounts of sodium aluminate used in combination with alum yielded good results. This hastened the alum reaction and secured a better floc, and resulted in a more effective removal of suspended matter and a clearer filter effluent. Less lime yielded the desired pH in the filtered water. Smaller amounts of chlorine produced satisfactory results; while in the end the sodium aluminate treatment proved, likewise, a little cheaper.

Latest Developments in Water Purification. George W. Fuller. Proceedings of Ninth Texas Water Works Short School, January, 1927, pp. 182–186. (Abstract by H. D. Cashmore.)

The newer developments in water purification have not been along the line of new processes but in the modification of the previous methods.

A brief discussion of each of the following developments is given with reference to the towns in which they were tried: (1) Superchlorination and dechlorination; (2) split chlorination and prechlorination; (3) double coagulation; (4) double filtration; (5) water softening; (6) effluent aeration; (7) mechanically cleaned settling basin; (8) new methods in coagulation of water; (9) boiler feed water; (10) new purification plants; (11) experimental studies on filter loading.

The Development of the Hydraulic Jump Mixing Flume for Water Purification. J. W. Ellms. Proceedings Ninth Texas Water Works Short School, January, 1927, pp. 180–182. (Abstract by H. D. Cashmore.)

The development of water purification processes pointed out the fact that thorough mixing of the chemicals with the water was a necessary procedure. The old baffled-mixing chambers and mechanical agitators were found to be faulty in many respects. The need for the proper mixing device was seen.

Experimental work was carried on at Cleveland, Ohio, by the city water department, under the direction of the author, who suggested the use of this procedure. Results of this work led to the following conclusions: (1) It is possible to design a flume in which the phenomenon can be produced; (2) costs of building the flume are about one-third that of the baffled mixing chamber; (3) the flume can be placed at the most suitable place; (4) the loss of head is low; (5) it is an extremely efficient mixing device.

The many installations now being used are ample evidence of the effectiveness of this method of mixing.

Power Gas from Sewage Sludge. Frank C. Vokes and Chas. B. Townsend. *The Surveyor*, vol. 72, No. 1873, December 16, 1927, p. 596. (Abstract by R. E. Thompson.)

Data are given on power production from sludge gas at the sewage works of the Birmingham, Tame, and Rea districts. About 400,000 tons of crude sludge, containing 8 per cent of dry solids, is digested each year. The sludge remains in the primary digestion tanks three months, is then pumped a distance of 4 miles to secondary digestion tanks for a period of two months, and is finally pumped onto drying beds. During digestion about 25 to 33 per cent of the solids is converted into a gas composed of 67 per cent methane, 30 per cent carbon dioxide, and 3 per cent nitrogen, having a calorific value of about 625 B. t. u. per cubic foot. Under the favorable conditions existing, the estimated production cost of current is 0.49d. per unit, effecting a net saving of over $1,000 per annum for the first unit. The estimated cost of gas production on the basis of 16,000,000 cubic feet per annum from this unit is 7½d. per 1,000 cubic feet. The estimated total available output of 10,000,000 horsepower-hours per annum is about 5 times the board's present requirements. Brief details of the reinforced concrete floating gas collector designed for the first unit are included.

Water Pollution Control—Milk Products Wastes. E. F. Eldridge, J. M. Hepler, and H. S. Murphy. Department of Health and Department of Conservation, Michigan, June, 1927. Pamphlet, 15 pages. (Abstract by E. W. Evans.)

This bulletin presents a compilation of several important findings on the treatment and purification of milk products wastes. Investigations conducted in Massachusetts, Wisconsin, New Jersey, New York, Ohio, Iowa, and by the United States Public Health Service are noted, with a brief discussion of the results found.

The experiments conducted at the Michigan State College in cooperation with the State health department are discussed in more detail. Preliminary laboratory experiments indicate that, in using the chemical precipitation method,

a good flow is secured and efficient settling occurs when sufficient quantities of ferrous sulphate and caustic soda are used. At least 0.6 p. p. m. of ferrous sulphate must be used or the precipitate will be red in color. Lime or caustic soda in quantities sufficient to produce a pH of 7.5 to 8.0 will give a good flow with good settling, but produces a large amount of sludge. Broad irrigation of milk products wastes is recommended as a temporary expedient where possible.

LaGrande, Oregon, Sewage Treatment Plant. L. R. Stockman. *Western Construction News*, vol. 3, No. 1, January 10, 1928, pp. 21–24. (Abstract by E. A. Reinke)

This article describes a plant consisting of a 50 by 50 foot Dorr clarifier, twin dosing siphons, and sprinkling filter with 35,000 square feet area. A part of an old septic tank was made over into a separate sludge digester 20 by 80 feet in plan and 15 feet deep, giving slightly less than 1 cubic foot per capita on a population of 15,000. A 3,500-square foot sludge drying bed is provided. Sand for the bed is obtained from the grit chambers, the sewage carrying an abnormally high quantity. The underdrain system of the sprinkling filter contains 76,000 concrete slabs laid over V-troughs in the floor.

An interesting side light on the conditions around the plant was the occurrence of typhoid at one dairy (and among customers of the dairy) using sewage effluent from the old septic tank for irrigation and allowing the cows free access to it. The dairyman brought suit against the city for permanent damages, but was granted only temporary damages because the new plant overcame the possibility of permanent damages.

The Treatment of Sludge. A. P. I. Cotterell. *Journal of the Royal Sanitary Institute*, vol. 48, No. 9, March, 1928, pp. 489–493. (Abstract by W. L. Havens.)

This paper gives a brief description and evaluation of 15 methods for the treatment of sewage sludge. Sludge is defined as residue accruing from the use of grit chambers, screens, and tanks. The methods listed are: (1) Crude sewage applied to land or absorbent; (2) spreading sludge over land; (3) trenching; (4) lagooning; (5) drying on filters; (6) septicization; (7) digestion; (8) yeast fermentation; (9) activation by air; (10) filter pressing; (11) dumping at sea; (12) burning; (13) distillation—experimental only; (14) gas production; (15) use in fertilizers.

Digestion with an end process of drying on filter beds is indicated as a most promising field for successful treatment. Reference is made to the author's "vertical digestion tank" supplemented by two to four months' storage in a series of tanks with reference to gas production; citation is made of installations at Bombay and in Germany and of a commercial project proposed in Australia (Paramatta). This is an excellent paper in brief consideration of the subject.

Work for the Water and Sewage Purification Committee. H. H. King. Report of the King Institute of Preventive Medicine, Guindy, for the year ending March 31, 1927, pp. 10–11. (Abstract by H. D. Cashmore.)

This is a progress report of a portion of the work carried on by the committee on sewage and water purfication. Work in regard to the value of percolating nonsubmerged filters as compared with an ordinary submerged slow sand filter, as well as a comparison of open and closed septic tanks and Imhoff tanks, was carried on.

At the same filtering rate for water the percolating filter gave the best results. At increased head over that used in the submerged filter the same results were obtained except for oxygen absorbed, which was nearly equal. At increased rates for both filters about the same ratio of efficiency was maintained from both a chemical and bacteriological standpoint.

In comparing the work of the sewage tanks it was found that the closed septic tank was better than the open tanks. Insufficient sewage did not allow a comparison of the work for the Imhoff tanks.

The Digestion of Vegetable Wastes and Screenings in Sewage Treatment Plants. W. Rudolfs and H. Heukelekian. **Water Works, vol. 67, No. 3, March,** 1928, pp. 113–116. (Abstract by C. R. Cox.)

Comprehensive researches in the digestion of mixtures of garbage, screenings, fresh sewage solids, and digested sludge were made to ascertain whether garbage could be digested with the sludge at sewage disposal plants. Studies in the digestion of vegetable wastes from canneries will be made in the future. It was found that mixtures of vegetable wastes and fresh sewage solids digested very slowly; that the addition of ripe sludge greatly hastened digestion; and that lime dosing still further hastened digestion. The rate of digestion of vegetable wastes and screenings is slow, owing to the production of acids, which inhibit the growth of putrefactive organisms. The addition of lime neutralizes acidity, the addition of ripe sludge seeds the mixtures, and the addition of fresh sewage solids provides the nitrogenous wastes necessary for normal digestion. It was concluded that vegetable wastes and screenings may be digested in sewage tanks provided the sludge capacity is adequate and provided the ratio of sewage solids to vegetable wastes (nitrogen to carbon) is large. The allowable ratios in practice will be determined by further studies.

The Solution of Oxygen in Sewage. A. S. Parsons and H. Wilson. *The Surveyor*, vol. 72, No. 1869, November 18, 1927, pp. 490–494. (Abstract by C. K. Calvert.)

Experiments were conducted to shed light on the arguments and theories established by the proponents of mechanical aeration. It is claimed that, in the air diffusion method, the film of water about the bubbles may be saturated, but that it follows the bubble to the surface and does not mix with the liquor until the bubble bursts. If this is the case a deep aerator, offering less surface area in proportion to its volume, is less economical than a shallow one.

Two aerators were constructed each 18 inches in diameter. One of them had 6 feet 6 inches and the other 22 feet 6 inches operating depth. Ratio of diffuser area to area of cross section of chamber was 1:9 2. Air was admitted at the same rate to each aerator. Two kinds of liquor were used—(1) sewage and (2) sewage plus activated sludge. The concentration of oxygen increased more rapidly in the plain sewage than with activated sludge, since biologic action is more rapid in the presence of the sludge; but the concentration of oxygen increased in the deep tank as rapidly as or a little more so than in the shallow tank, when like liquors were used in them. The tanks were filled with a mixture of activated sludge and sewage, and air was applied equally as before. The rate of reduction of ammoniacal nitrogen and oxygen demand and the increase of nitric nitrogen were the same in the deep and shallow tanks. However, in aerating to the point of elimination of ammoniacal nitrogen (14 hours) about three times as much air was used in the shallow as in the deep chamber.

The authors conclude that the deep tank is more economical than the shallow one, but point out that in the former more trouble is experienced with sludge floating on account of entrained air. They suggest that the depth of tank should be given attention in its relation to the handling of specific sewages.

Laboratory experiments are reported showing that oxygen concentration is built up very much more rapidly in sewage the pH of which is modified either by the addition of acid or alkali. Sewage pH of 4, 6, 8, and 10, and distilled water at pH 7.6 were found to run near together. The original sewage Hp was 8.0.

DEATHS DURING WEEK ENDED JUNE 9, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended June 9, 1928, and corresponding week of 1927. (From the Weekly Health Index, June 13, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended June 9, 1928	Corresponding week, 1927
Policies in force	71,349,157	67,889,339
Number of death claims	14,477	12,910
Death claims per 1,000 policies in force, annual rate	10.6	9.9

Deaths from all causes in certain large cities of the United States during the week ended June 9, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, June 13, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended June 9, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate week ended June 9, 1928[2]
	Total deaths	Death rate[1]		Week ended June 9, 1928	Corresponding week, 1927	
Total (68 cities)	7,458	13.0	12.0	768	706	63
Akron	35			4	1	48
Albany[3]	29	12.6	20.1	1	4	20
Atlanta	95	19.5	14.0	6	7	
White	50		10.1	4	2	
Colored	45	(4)	23.3	2	5	
Baltimore[3]	226	14.2	12.2	19	20	60
White	150		10.9	8	6	32
Colored	76	(4)	19.5	11	14	172
Birmingham	77	18.1	12.7	9	6	77
White	36		9.8	3	3	41
Colored	41	(4)	17.2	6	3	135
Boston	246	16.1	14.1	36	36	100
Bridgeport	25			0	1	0
Buffalo	165	15.5	12.3	28	16	120
Cambridge[3]	34	14.1	9.7	3	2	53
Camden	34	13.1	12.5	3	6	48
Canton	25	11.2	6.0	1	3	24
Chicago[3]	706	11.7	11.4	63	47	54
Cincinnati	139	17.6	14.8	11	7	66
Cleveland	214	11.1	10.9	19	19	52
Columbus	66	11.6	13.4	6	5	56
Dallas	39	9.4	10.6	4	4	
White	29		8.5	2	4	
Colored	10	(4)	24.7	2	0	
Dayton	44	12.5	12.7	2	8	83
Denver	72	12.8	11.2	8	4	
Des Moines	32	11.0	11.9	1	3	17
Detroit	282	10.7	10.6	49	48	76
Duluth	23	10.3	6.4	2	2	47
El Paso	35	15.5	17.0	11	8	
Erie	30			2	4	41
Fall River[3]	26	10.1	13.0	5	2	86
Flint	29	10.2	6.2	7	1	89
Fort Worth	38	11.8	8.6	3	3	
White	33		8.0	2	3	
Colored	5	(4)	13.3	1	0	
Grand Rapids	31	9.9	11.9	2	6	30
Houston	72			7	5	
White	58			6	4	
Colored	14	(4)		1	1	
Jersey City	78	12.6	11.0	13	10	97
Kansas City, Kans	30	13.3	12.4	1	2	21
White	21		9.7	1	2	25
Colored	9	(4)	24.6	0	0	0
Kansas City, Mo	104	13.9	10.9	7	4	49
Knoxville	31	15.4	17.9	2	6	43
White	27		12.8	2	6	48
Colored	4	(4)	55.6	0	0	0

(See footnotes at end of table.)

Deaths from all causes in certain large cities of the United States during the week ended June 9, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927—Continued

City	Week ended June 9, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate week ended June 9, 1928 [2]
	Total deaths	Death rate [1]		Week ended June 9, 1928	Corresponding week, 1927	
Los Angeles	238			17	28	49
Lowell	29	13.7	12.3	1	1	21
Lynn	26	12.9	10.4	2	4	50
Memphis	63	17.3	15.7	6	6	70
White	34		11.7	4	5	75
Colored	29	(4)	23.0	2	1	63
Milwaukee	133	12.8	9.8	23	8	103
Minneapolis	81	9.3	12.5	4	5	24
Nashville	48	18.1	17.8	1	4	16
White	26		14.2	1	4	21
Colored	22	(4)	26.8	0	0	0
New Bedford	34	14.9	10.9	4	5	87
New Haven	49	13.6	8.7	5	3	71
New Orleans	135	16.4	17.8	13	18	63
White	72		15.1	5	12	36
Colored	63	(4)	25.5	8	6	116
New York	1,536	13.3	11.8	170	157	69
Bronx Borough	200	11.0	9.3	18	21	54
Brooklyn Borough	510	11.6	10.1	69	56	69
Manhattan Borough	633	18.9	16.6	69	59	82
Queens Borough	152	9.3	8.5	12	16	48
Richmond Borough	41	14.2	14.9	2	5	36
Newark, N. J	107	11.8	11.2	7	16	36
Oakland	69	13.2	9.6	5	3	54
Oklahoma City	33			3	8	
Omaha	30	7.0	11.7	7	3	81
Paterson	34	12.3	10.9	5	2	87
Philadelphia	496	12.6	11.6	48	48	65
Pittsburgh	181	14.1	13.9	16	15	52
Portland, Oreg	103			5	5	54
Providence	65	11.9	9.8	8	7	70
Richmond	56	15.1	15.8	7	4	9[illegible]
White	29		12.3	4	3	81
Colored	27	(4)	24.4	3	1	110
Rochester	77	12.3	12.7	7	11	57
St. Louis	238	14.7	12.1	23	8	77
St. Paul	58	12.0	11.9	2	1	19
Salt Lake City [3]	36	13.6	10.4	2	5	33
San Antonio	67	16.1	13.1	15	11	
San Diego	45	19.7	17.6	1	3	19
San Francisco	165	14.7	17.1	5	7	31
Schenectady	24	13.4	9.0	2	6	63
Seattle	59	8.1	7.9	1	3	10
Somerville	27	13.7	6.7	3	1	104
Spokane	32	15.3	15.8	3	1	77
Springfield, Mass	28	9.8	10.3	3	4	48
Syracuse	51	13.4	11.9	6	3	73
Tacoma	23	10.9	13.1	2	3	51
Toledo	69	11.5	10.9	6	4	58
Trenton	36	13.5	16.4	4	8	68
Utica	20	10.0	14.6	0	3	0
Washington, D. C	146	13.8	12.9	13	13	74
White	83		10.7	8	7	66
Colored	63	(4)	19.5	5	6	92
Waterbury	17			1	1	29
Wilmington, Del	25	10.2	12.0	3	1	79
Worcester	44	11.6	15.7	4	3	49
Yonkers	25	10.8	9.7	5	2	114
Youngstown	41	12.3	8.3	4	7	53

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left bank are not in the registration area for births.
[3] Deaths for week ended Friday, June 8, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring .

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 16, 1928, and June 18, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 16, 1928, and June 18, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927
New England States:								
Maine	5	2	6	....	63	112	0	0
New Hampshire	2	....	....	....	8	....	0	....
Vermont	....	....	....	....	45	72	0	0
Massachusetts	71	86	16	2	687	344	1	1
Rhode Island	2	5	....	1	210	4	0	0
Connecticut	14	28	1	....	289	55	0	2
Middle Atlantic States:								
New York	399	398	[1] 19	[1] 9	3,062	809	41	4
New Jersey	152	121	38	5	1,314	48	4	1
Pennsylvania	162	144	....	....	2,494	584	9	2
East North Central States:								
Ohio	85	....	268	....	1,099	....	1	....
Indiana	17	23	2	2	345	69	0	0
Illinois	126	114	28	20	216	373	7	11
Michigan	64	68	6	....	1,004	190	6	2
Wisconsin	14	31	107	32	48	540	0	12
West North Central States:								
Minnesota	32	21	1	3	63	68	2	2
Iowa	5	17	....	....	11	94	1	0
Missouri	18	27	1	1	275	124	3	0
North Dakota	1	4	2	....	4	26	0	0
South Dakota	1	3	....	1	5	23	1	0
Nebraska	7	11	16	....	18	41	0	0
Kansas	5	3	1	1	101	355	1	0
South Atlantic States:								
Delaware	....	1	....	....	16	2	0	0
Maryland [2]	27	50	7	6	241	24	0	0
District of Columbia	10	17	....	1	124	2	0	0
Virginia	....	....	....	....	....	....	1	....
West Virginia	6	7	62	2	68	132	1	2
North Carolina	12	10	....	....	360	1,292	0	1
South Carolina	10	4	297	123	99	125	0	0
Georgia	3	6	27	20	50	44	0	1
Florida	6	9	27	26	118	33	0	0

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 16, 1928, and June 18, 1927—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927
East South Central States:								
Kentucky	7				188		0	
Tennessee	3	5	75	14	95	37	0	2
Alabama	9	24	87	20	151	189	1	0
Mississippi	3	6		11				
West South Central States:								
Arkansas	1	3	85	11	102	45	0	0
Louisiana	13	18	20	8	64	50	1	1
Oklahoma [3]	10	7	24	18	62	129	2	1
Texas	9	21	30	13	51	133	0	1
Mountain States:								
Montana	1			1	5	19	1	1
Idaho		5			1	15	1	1
Wyoming	5	1			9	64	0	0
Colorado	3	48	1		35	62	1	0
New Mexico	4				28	57	0	0
Arizona	4	3			205	17	1	0
Utah [1]	2	7	3			16	0	2
Pacific States:								
Washington	14	10			37	478	5	1
Oregon	6	7	6	8	35	139	1	4
California	79	93	22	10	49	571	3	7

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927
New England States:								
Maine	0	0	23	25	0	0	1	7
New Hampshire	0		13		0		0	
Vermont	0	0	6	5	0	0	0	1
Massachusetts	1	1	209	290	0	0	4	1
Rhode Island	0	0	12	15	0	0	0	0
Connecticut	1	1	27	56	0	0	0	1
Middle Atlantic States:								
New York	6	1	336	488	0	1	10	20
New Jersey	0	1	135	212	1	1	4	7
Pennsylvania	1	0	325	279	0	0	1	24
East North Central States:								
Ohio	1		113				9	
Indiana	0	0	39	75	59	76	2	3
Illinois	0	0	219	180	17	13	9	17
Michigan	0	1	261	197	29	24	6	8
Wisconsin	1	0	126	123	12	18	6	2
West North Central States:								
Minnesota	1	0	100	80	2	3	1	4
Iowa	0	0	46	25	44	20	0	1
Missouri	1	0	47	38	26	18	4	10
North Dakota	0	1	5	19	0	0	0	0
South Dakota	0	0	13	10	1	8	0	0
Nebraska	0	0	38	11	16	8	5	1
Kansas	0	0	54	45	47	14	1	7
South Atlantic States:								
Delaware	0	0	7	0	1	0	1	0
Maryland [1]	0	1	33	41	0	3	4	7
District of Columbia	0	0	27	12	0	12	1	2
Virginia	1							
West Virginia	0	0	7	23	9	29	4	8
North Carolina	0	0	23	15	46	19	12	26
South Carolina	3	0	6	4	3	8	48	77
Georgia	0	0	7	12	0	10	11	49
Florida	1	0	5	3	2	25	13	24

[1] Week ended Friday.

[3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 16, 1928, and June 18, 1927—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927	Week ended June 16, 1928	Week ended June 18, 1927
East South Central States:								
Kentucky	0	-------	34	-------	23	-------	3	-------
Tennessee	0	1	13	16	35	9	20	66
Alabama	0	1	3	11	11	21	13	55
Mississippi	1	3	4	7	0	0	15	37
West South Central States:								
Arkansas	0	2	4	0	3	0	4	23
Louisiana	1	1	5	4	20	15	27	34
Oklahoma [2]	2	0	21	16	69	26	9	21
Texas	1	0	20	15	34	5	2	17
Mountain States:								
Montana	0	0	2	14	4	14	0	0
Idaho	0	0	2	8	1	2	2	1
Wyoming	0	0	17	11	2	3	6	0
Colorado	1	1	21	93	0	3	1	3
New Mexico	0	0	6	12	0	0	2	8
Arizona	0	2	3	2	1	0	4	0
Utah [1]	0	0	5	14	5	3	0	1
Pacific States:								
Washington	0	0	32	42	11	43	5	5
Oregon	1	0	6	15	29	15	4	8
California	4	14	128	136	18	13	12	3

[1] Week ended Friday. [2] Exclusive of Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
May, 1928										
Arizona	4	30	9	-------	151	1	2	11	37	10
Connecticut	8	98	231	-------	1,472	-------	0	385	11	4
Michigan	0	319	79	-------	4,925	1	4	1,160	95	17
Nebraska	2	33	68	-------	306	-------	0	395	0	2
New Jersey	29	560	138	-------	8,969	-------	5	956	3	16
North Dakota	2	5	434	-------	70	-------	0	100	10	2
Tennessee	2	43	1,028	119	842	41	1	74	133	36
Vermont	0	-------	-------	-------	228	-------	0	47	1	3

May, 1928

Anthrax:
- New Jersey ... 1

Chicken pox:
- Arizona ... 28
- Connecticut ... 314
- Michigan ... 413
- Nebraska ... 168
- New Jersey ... 738
- North Dakota ... 35
- Tennessee ... 94
- Vermont ... 107

Conjunctivitis:
- Connecticut ... 6

Dysentery:
- Arizona (amoebic) ... 4
- Connecticut (amoebic) ... 1

Dysentery—Continued.
- New Jersey ... 2
- Tennessee ... 5

German measles:
- Connecticut ... 112
- New Jersey ... 1,303

Lethargic encephalitis:
- Connecticut ... 4
- Michigan ... 7
- North Dakota ... 2

Mumps:
- Arizona ... 75
- Connecticut ... 466
- Michigan ... 987
- Nebraska ... 108
- North Dakota ... 23

Mumps—Continued.
- Tennessee — 288
- Vermont — 79

Ophthalmia neonatorum:
- New Jersey — 1
- Tennessee — 5

Puerperal septicemia:
- Tennessee — 1

Rabies in animals:
- Connecticut — 2

Scabies:
- North Dakota — 3

Septic sore throat:
- Connecticut — 8
- Michigan — 24
- Nebraska — 5
- Tennessee — 5

Tetanus:
- Connecticut — 1
- Tennessee — 5

Trachoma:
- Arizona — 13
- New Jersey — 4
- Tennessee — 14

Vincent's angina:
- North Dakota — 5

Whooping cough.
- Arizona — 12
- Connecticut — 446
- Michigan — 622
- Nebraska — 45
- New Jersey — 654
- North Dakota — 41
- Tennessee — 98
- Vermont — 46

Number of Cases of Certain Communicable Diseases Reported for the Month of April, 1928, by State Health Officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	102	11	127	154	94	0	27	2	91
New Hampshire		11			62	0		3	
Vermont	121	4	282	193	40	0	12	16	
Massachusetts	655	338	6,436	998	1,129	0	606	11	823
Rhode Island	30	44	1,297	112	188	0	55	0	20
Connecticut	318	103	1,476	805	293	0	145	6	441
New York	1,719	1,387	12,426	2,068	3,045	13	1,722	46	1,720
New Jersey	568	439	6,470		1,083	54	448	15	548
Pennsylvania	1,617	686	8,907	3,531	1,938	13	734	35	1,100
Ohio	964	429	3,951	1,362	1,031	182	753	25	549
Indiana	271	81	1,670	445	309	515	209	7	122
Illinois	1,071	509	819	1,149	1,255	124	1,083	33	1,070
Michigan	552	232	6,376	1,580	1,094	141	517	23	574
Wisconsin	904	85	422	641	667	35	221	10	190
Minnesota	458	97	202		554	7	283	9	157
Iowa	117	28	109	247	274	190	66	9	28
Missouri	239	150	1,739	577	438	275	233	10	185
North Dakota	47	26	38	62	190	8	18	3	47
South Dakota	50	8	202	17	161	46	10	4	10
Nebraska	167	25	317	209	413	0	[1] 11	1	27
Kansas	438	29	554	747	730	347	104	8	283
Delaware [2]									
Maryland	352	125	3,630	149	314	2	236	32	207
District of Columbia	55	64	775		156	6	93	1	32
Virginia	628	80	3,348		161	33	[1] 133	20	500
West Virginia	208	66	708		135	217	116	28	45
North Carolina	517	116	8,032		97			10	494
South Carolina	228	74	2,609	55	34	41	186	40	417
Georgia	243	33	510	75	64	20	69	18	77
Florida	246	35	309	92	50	29	87	26	32
Kentucky [3]									
Tennessee	111	55	1,937	343	116	132	194	22	145
Alabama	225	54	1,670	142	37	28	507	20	126
Mississippi	852	55	7,406	1,393	48	35	271	50	1,899
Arkansas	62	14	1,310	141	64	48	[1] 25	11	65
Louisiana	30	98	893	10	34	83	[1] 155	47	30
Oklahoma [4]	65	67	1,021	146	204	482	48	26	99
Texas [3]									
Montana	71	23	30	7	87	105	18	2	42
Idaho	47	1	10	47	56	41	[1] 6	11	12
Wyoming	29	1	69	24	107	7		2	22
Colorado	298	52	502	500	390	34	109	2	87
New Mexico [3]									
Arizona	43	38	131	64	20	86	88	6	10
Utah [3]									
Nevada [5]									
Washington	401	41	662	368	190	195	181	17	61
Oregon	218	37	379	84	40	237	64	14	19
California	2,327	363	522	1,403	501	91	967	17	1,202

[1] Pulmonary.
[2] Reports not received at time of going to press.
[3] Reports received weekly.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Reports received annually.

Case Rates per 1,000 Population (Annual Basis) for the Month of April, 1928

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	1.57	0.17	1.95	2.36	1.44	.00	0.41	0.03	1.40
New Hampshire		.29			1.66	.00		.08	
Vermont	4.19	.14	9.76	6.68	1.38	.00	.42	.55	
Massachusetts	1.86	.96	18.30	2.84	3.21	.00	1.72	.03	2.34
Rhode Island	.51	.75	22.10	1.91	3.20	.00	.94	.00	.34
Connecticut	2.33	.75	10.80	6.55	2.14	.00	1.06	.04	3.23
New York	1.82	1.46	13.12	2.18	3.22	.01	1.82	.05	1.82
New Jersey	1.81	1.40	20.66		3.46	.17	1.43	.05	1.75
Pennsylvania	2.04	.85	11.03	4.37	2.40	.02	.91	.04	1.37
Ohio	1.72	.77	7.06	2.43	1.84	.33	1.35	.04	.98
Indiana	1.04	.31	6.41	1.71	1.53	1.98	.80	.03	.47
Illinois	1.77	.84	1.35	1.90	2.07	.20	1.79	.05	1.77
Michigan	1.47	.62	16.94	4.20	2.91	.37	1.37	.06	1.53
Wisconsin	3.73	.35	1.74	2.65	2.76	.14	.91	.04	.78
Minnesota	2.05	.43	1.31		2.48	.03	1.27	.04	.70
Iowa	.59	.13	.55	1.24	1.38	95	.33	.05	.13
Missouri	.83	.52	6.02	2.00	1.52	.95	.81	.03	.64
North Dakota	.80	.49	.72	1.18	3.62	.15	.34	06	.89
South Dakota	.87	.14	3.50	.29	2.79	.80	.17	.07	.17
Nebraska	1.45	.22	2.75	1.81	3.58	.00	[1] .10	.01	.23
Kansas	2.91	.19	3.68	4.97	4.85	2.31	.69	.05	1.88
Delaware [2]									
Maryland	2.66	.94	27.41	1.12	2.37	.02	1.78	.24	1.56
District of Columbia	1.22	1.41	17.13		3.45	.13	2.06	.02	.71
Virginia	2.98	.38	15.86		.76	.16	[1] .63	.14	2.37
West Virginia	1.44	.47	5.01		.96	1.54	.82	.20	.32
North Carolina	2.15	.48	33.35		.40			.04	2.05
South Carolina	1.49	.48	17.08	.36	.22	.27	1.22	.26	2.73
Georgia	.93	.13	1.94	.29	.24	.11	.26	.07	.29
Florida	2.13	.30	2.67	.80	.43	.25	.75	.22	.28
Kentucky [3]									
Tennessee	.54	.27	9.44	1.67	.57	.64	.95	.11	.71
Alabama	1.07	.26	7.02	.67	.18	.13	2.40	.09	.60
Mississippi	5.80	.37	50.46	9.49	.33	.24	1.85	.34	12.94
Arkansas	.39	.09	8.22	.88	.40	.30	[1] .16	.07	.41
Louisiana	.19	.61	5.59	.06	.21	.52	[1] .97	.29	.23
Oklahoma [4]	.37	.38	9.22	.83	1.16	2.74	.27	.15	.56
Texas [3]									
Montana	1.58	.51	.67	.16	1.93	2.33	.40	.04	.98
Idaho	1.05	.02	.22	1.05	1.25	.92	[1] .13	.25	.27
Wyoming	1.43	.05	3.41	1.19	5.29	.35		.10	1.09
Colorado	3.34	.58	5.62	5.60	4.37	.38	1.22	.02	.97
New Mexico [3]									
Arizona	1.11	.98	3.37	1.65	.75	2.21	2.26	.15	.26
Utah [3]									
Nevada [5]									
Washington	3.08	.32	5.09	2.83	1.46	1.50	1.39	.13	.47
Oregon	2.95	.50	5.13	1.14	.54	3.21	.87	.19	.26
California	6.23	.97	1.40	3.76	1.34	.24	2.59	.05	3.21

[1] Pulmonary.
[2] Reports not received at time of going to press.
[3] Reports received weekly.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Reports received annually.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 100 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,627,000. The estimated population of the 94 cities reporting deaths is more than 30,930,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended June 2, 1928, and June 4, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	1,196	1,648	
100 cities	738	938	805
Measles:			
42 States	15,996	10,628	
100 cities	7,358	2,603	
Poliomyelitis, 43 States	32	28	
Scarlet fever:			
43 States	2,885	3,423	
100 cities	1,250	1,306	1,012
Smallpox:			
43 States	860	721	
100 cities	77	126	99
Typhoid fever:			
43 States	280	498	
100 cities	71	80	58
Deaths reported			
Influenza and pneumonia, 94 cities	975	583	
Smallpox, 94 cities	0	0	

City reports for week ended June 2, 1928

•The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	11	0	0	0	0	9	7	2
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	10	0	0
Manchester	84,000	0	1	0	0	1	4	0	3
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	23	44	22	9	2	87	4	35
Fall River	131,000	1	3	0	2	1	10	1	3
Springfield	145,000	5	2	2	2	2	1	13	1
Worcester	193,000	5	3	2	0	0	33	38	3
Rhode Island:									
Pawtucket	71,000	0	0	0	0	0	25	15	5
Providence	275,000	0	6	4	0	1	188	0	9
Connecticut:									
Bridgeport	([2])	2	5	5	1	0	15	0	3
Hartford	164,000	5	5	4	0	0	81	2	4
New Haven	182,000	12	2	4	5	1	32	11	10

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended June 2, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	10	8	11		1	48	28	29
New York	5,924,000	169	247	242	53	25	2,583	38	221
Rochester	321,000	2	9	0		1	117	35	5
Syracuse	185,000	16	4	0		7	88	8	5
New Jersey:									
Camden	131,000	2	5	9	2	2	90	6	1
Newark	459,000	23	10	30	4	1	158	6	20
Trenton	134,000	2	3	0	0	0	16	2	4
Pennsylvania:									
Philadelphia	2,008,000	54	65	58	0	5	1,243	41	51
Pittsburgh	637,000	24	17	14	0	7	70	38	37
Reading	114,000	4	2	1	0	0	28	0	1
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	12	8	2	0	1	22	0	10
Cleveland	960,000	44	23	21	7	4	125	41	27
Columbus	285,000	2	3	3	3	4	95	2	1
Toledo	295,000	21	4	4	0	0	127	7	1
Indiana:									
Fort Wayne	99,900	1	2	2	0	0	3	0	1
Indianapolis	367,000	17	4	3	0	1	178	41	9
South Bend	81,700	3	1	0	0	0	1	0	0
Terre Haute	71,900	5	0	0	0	1	2	0	1
Illinois:									
Chicago	3,048,000	70	71	88	14	9	42	26	92
Springfield	64,700	7	0	0	2	2	0	1	0
Michigan:									
Detroit	[3] 1,242,044	25	43	35	4	7	307	11	25
Flint	136,000	9	3	0	0	1	221	6	5
Grand Rapids	[1] 156,000	2	2	1	0	0	12	2	4
Wisconsin:									
Kenosha	52,700	20	0	0	0	0	0	1	2
Milwaukee	517,000	57	13	6	2	2	2	12	19
Racine	69,400	2	1	0	0	0	0	1	1
Superior	[1] 39,671	0	0	0	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	5	0	0	0	0	0	3	1
Minneapolis	434,000	44	14	14	0	1	51	65	8
St. Paul	248,000	15	10	1	0	2	11	8	9
Iowa:									
Davenport	[1] 52,469	2	1	0	0		0	0	
Des Moines	146,000	0	1	0	0		0	0	
Sioux City	78,000	2	0	0	0		0	16	
Waterloo	36,900	5	0	2	0		1	7	
Missouri:									
Kansas City	375,000	16	4	1	0	3	60	24	8
St. Joseph	78,400	0	0	0	0	0	2	2	1
St. Louis	830,000	15	35	19	0	0	239	8	
North Dakota:									
Fargo	[1] 26,403	1	0	0	0	0	0	0	0
Grand Forks	[1] 14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	0	0	0	0		0	0	
Sioux Falls	[1] 30,127	0	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	25	0	0	0	0	3	5	0
Omaha	216,000	15	2	4	0	0	1	0	2
Kansas:									
Topeka	56,500	15	0	1	1	1	9	1	0
Wichita	92,500	7	1	1	0	0	12	0	0
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	0	1	1	0	0	22	3	3
Maryland:									
Baltimore	808,000	74	19	31	6	0	210	46	28
Cumberland	[1] 33,741	1	0	1	0	0	5	0	1
Frederick	[1] 12,035	0	0	0	0	0	15	0	0

[1] Estimated, July 1, 1925. [3] Special census.

City reports for week ended June 2, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC—con.									
District of Columbia:									
Washington	528,000	20	9	14	1	1	215	0	6
Virginia:									
Lynchburg	[1] 38,493	11	0	0	0	0	27	3	0
Norfolk	174,000	4	0	0	0	0	0	0	7
Richmond	189,000	2	0	1	0	0	36	0	3
Roanoke	61,900	3	0	1	0	0	5	0	0
West Virginia:									
Charleston	50,700	1	0	0	0	1	1	0	3
Wheeling	[1] 56,208	14	0	0	0	0	6	2	1
North Carolina:									
Raleigh	[1] 30,371	0	0	0	0	0	18	0	0
Wilmington	37,700	6	0	0	0	1	0	0	0
Winston-Salem	71,800	4	0	1	0	0	3	4	2
South Carolina:									
Charleston	74,100	0	0	0	7	0	0	1	3
Columbia	41,800	6	1	0	0	0	2	15	4
Greenville	[1] 27,311	-------	0	-------	-------	-------	-------	-------	-------
Georgia:									
Atlanta	([2])	6	1	2	18	0	14	6	12
Brunswick	[1] 16,809	2	0	0	0	0	1	8	0
Savannah	94,900	2	0	0	18	2	1	1	3
Florida:									
Miami	[3] 131,286	9	4	0	0	0	3	2	1
St. Petersburg	47,629	-------	0	-------	-------	0	-------	-------	0
Tampa	102,000	2	0	1	0	0	0	0	2
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	1	0	1	0	0	0	0	3
Louisville	311,000	0	3	0	0	0	123	0	19
Tennessee:									
Memphis	177,000	7	1	5	0	0	9	5	5
Nashville	137,000	0	0	1	0	0	7	1	5
Alabama:									
Birmingham	211,000	3	0	1	23		66	3	7
Mobile	66,800	0	0	0	0	0	2	0	0
Montgomery	47,000	1	0	1	0	-------	1	0	-------
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	2	0	0	0	-------	0	2	-------
Little Rock	75,900	1	0	0	0	2	4	1	6
Louisiana:									
New Orleans	419,000	7	5	8	4	2	1	0	12
Shreveport	59,500	1	0	0	0	0	8	0	0
Oklahoma:									
Oklahoma City	([2])	2	1	0	4	0	3	2	1
Tulsa	133,000	5	0	0	0	-------	2	1	-------
Texas:									
Dallas	203,000	13	3	3	0	0	13	0	2
Fort Worth	159,000	3	1	5	0	0	2	0	2
Galveston	49,100	0	0	0	0	0	1	0	0
Houston	[1] 164,954	1	2	2	0	0	11	0	5
San Antonio	205,000	0	1	1	0	2	6	0	6
MOUNTAIN									
Montana:									
Billings	[1] 17,971	4	0	0	0	0	0	0	0
Great Falls	[1] 29,883	7	0	0	0	0	6	0	0
Helena	[1] 12,037	0	0	0	0	0	1	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	1	0	0	0	0	0	0	0
Colorado:									
Denver	285,000	36	9	6	-------	4	96	45	10
Pueblo	43,900	3	1	0	0	0	8	0	0
New Mexico:									
Albuquerque	[1] 21,000	8	1	0	0	0	3	0	0
Utah:									
Salt Lake City	133,000	31	4	2	0	1	1	1	2
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended June 2, 1928—**Continued**

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
PACIFIC									
Washington:									
Seattle	(2)	43	4	5	0	-------	18	8	-------
Spokane	109,000	14	2	6	0	-------	0	0	-------
Tacoma	106,000	1	1	0	0	0	17	34	0
Oregon:									
Portland	[1] 282,383	23	5	5	0	0	16	1	7
California:									
Los Angeles	(2)	78	38	17	13	1	29	48	12
Sacramento	73,400	12	3	0	0	0	5	16	3
San Francisco	567,000	42	17	14	0	1	16	16	6

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	2	3	0	0	0	0	1	0	0	0	18
New Hampshire:											
Concord	0	1	0	0	0	0	0	0	0	0	10
Manchester	1	1	0	0	0	0	0	0	0	0	19
Vermont:											
Barre	1	0	0	0	0	0	0	0	0	0	1
Massachusetts:											
Boston	56	55	0	0	0	16	2	1	0	33	241
Fall River	3	6	0	0	0	4	0	1	0	0	44
Springfield	6	5	0	0	0	2	0	0	0	2	28
Worcester	8	9	0	0	0	4	0	23	0	0	53
Rhode Island:											
Pawtucket	1	5	0	0	0	0	0	0	0	1	18
Providence	7	20	0	0	0	3	0	0	1	2	68
Connecticut:											
Bridgeport	9	2	0	0	0	4	0	0	0	2	36
Hartford	3	1	0	0	0	4	0	0	0	7	36
New Haven	5	1	0	0	0	1	1	0	0	17	61
MIDDLE ATLANTIC											
New York:											
Buffalo	16	44	0	0	0	15	0	0	0	10	178
New York	210	240	0	0	0	104	9	0	1	124	1,590
Rochester	12	5	0	0	0	0	0	1	0	3	70
Syracuse	7	7	0	0	0	2	0	0	0	14	57
New Jersey:											
Camden	5	2	0	0	0	2	0	0	0	3	26
Newark	21	23	0	0	0	13	1	0	0	30	144
Trenton	2	3	0	0	0	2	0	0	0	1	42
Pennsylvania:											
Philadelphia	79	60	0	0	0	50	4	1	0	64	519
Pittsburgh	28	24	0	0	0	4	1	0	0	14	179
Reading	2	3	0	0	0	1	0	1	0	7	25
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	13	36	2	0	0	13	1	1	1	4	129
Cleveland	30	17	1	0	0	17	0	1	0	27	203
Columbus	7	3	1	0	0	6	0	0	0	2	64
Toledo	10	3	1	0	0	6	0	0	0	8	56

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended June 2, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
EAST NORTH CENTRAL—continued											
Indiana:											
Fort Wayne	2	4	2	1	0	0	0	0	0	0	15
Indianapolis	8	17	11	4	0	4	0	0	0	4	77
South Bend	2	0	1	0	0	1	0	0	0	0	16
Terre Haute	2	0	0	1	0	0	0	0	0	0	17
Illinois:											
Chicago	101	73	2	4	0	46	3	0	0	64	705
Springfield	2	9	1	2	0	0	1	0	0	5	14
Michigan:											
Detroit	70	119	2	0	0	31	3	1	0	63	324
Flint	5	10	1	3	0	1	0	0	0	4	30
Grand Rapids	6	3	1	0	0	0	0	0	0	2	36
Wisconsin:											
Kenosha	2	0	1	0	0	1	0	0	0	13	12
Milwaukee	17	50	1	0	0	9	0	1	0	14	128
Racine	4	3	1	0	0	1	0	0	0	6	12
Superior	2	4	1	0	0	0	0	0	0	0	7
WEST NORTH CENTRAL											
Minnesota:											
Duluth	6	4	2	0	0	2	0	1	0	5	20
Minneapolis	31	22	7	0	0	3	1	0	0	23	81
St. Paul	19	11	2	0	0	2	0	0	0	38	67
Iowa:											
Davenport	0	2	1	2	------	------	0	0	------	0	------
Des Moines	5	5	2	18	------	------	0	0	------	0	24
Sioux City	1	2	2	0	------	------	0	0	------	1	------
Waterloo	1	3	0	0	------	------	0	0	------	3	------
Missouri:											
Kansas City	7	42	1	1	0	9	0	1	0	3	71
St. Joseph	1	6	0	1	0	1	1	0	0	4	19
St. Louis	27	20	3	1	0	17	2	0	0	23	220
North Dakota:											
Fargo	0	0	0	0	0	1	0	0	0	6	10
Grand Forks	1	0	0	0	------	------	0	0	------	0	------
South Dakota:											
Aberdeen	2	0	0	0	------	------	0	0	------	1	------
Sioux Falls	1	5	0	0	------	------	0	0	------	0	5
Nebraska:											
Lincoln	1	7	0	3	0	0	0	0	0	1	10
Omaha	4	2	5	6	0	2	0	0	0	1	32
Kansas:											
Topeka	1	6	1	1	0	0	0	0	0	1	20
Wichita	2	1	0	5	0	3	0	0	0	4	21
SOUTH ATLANTIC											
Delaware:											
Wilmington	4	5	0	0	0	1	0	0	0	0	40
Maryland:											
Baltimore	28	28	1	0	0	19	2	2	0	44	223
Cumberland	1	0	0	0	0	0	0	0	0	1	9
Frederick	0	0	0	0	0	0	0	0	0	0	4
District of Col.:											
Washington	17	45	1	0	0	13	1	2	1	7	127
Virginia:											
Lynchburg	1	0	0	0	0	0	0	0	0	10	8
Norfolk	1	5	1	2	0	1	0	0	0	0	------
Richmond	2	1	0	0	0	4	1	0	0	2	58
Roanoke	0	1	1	0	0	2	0	0	0	0	13
West Virginia:											
Charleston	0	1	0	0	0	2	1	0	1	0	22
Wheeling	2	0	0	0	0	0	0	0	0	0	17
North Carolina:											
Raleigh	0	0	0	0	0	1	0	0	0	2	10
Wilmington	0	0	0	0	0	0	0	0	0	0	9
Winston-Salem	0	4	2	0	0	2	1	1	0	0	19
South Carolina:											
Charleston	0	0	0	3	0	1	1	2	0	2	25
Columbia	0	0	0	0	0	3	1	0	0	7	42
Greenville	0	------	1	------	------	------	0	------	------	------	------

City reports for week ended June 2, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC—continued											
Georgia:											
Atlanta	3	14	7	2	0	4	2	0	1	6	-------
Brunswick	0	1	0	0	0	0	0	1	1	0	9
Savannah	0	0	1	0	0	4	1	1	0	0	40
Florida:											
Miami	0	0	0	0	0	0	1	1	0	0	15
St. Petersburg	0	-------	0	-------	0	0	0	-------	0	-------	9
Tampa	0	0	0	0	0	0	1	0	0	6	20
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	5	0	1	0	3	0	0	0	0	22
Louisville	6	45	1	0	0	10	1	0	0	6	125
Tennessee:											
Memphis	4	2	2	1	0	10	1	1	1	6	90
Nashville	2	0	1	2	0	9	1	2	0	1	67
Alabama:											
Birmingham	1	0	5	5	0	7	2	9	0	2	75
Mobile	0	4	1	0	0	1	0	1	0	0	20
Montgomery	0	1	0	0	-------	-------	0	0	-------	0	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0	-------	-------	0	3	-------	7	-------
Little Rock	0	11	0	0	0	0	1	0	0	0	-------
Louisiana:											
New Orleans	3	4	1	0	0	19	2	2	0	3	165
Shreveport	0	0	1	3	0	1	0	0	1	0	27
Oklahoma:											
Oklahoma City	2	14	2	7	0	3	0	0	0	0	23
Tulsa	2	3	1	1	-------	-------	0	1	-------	1	-------
Texas:											
Dallas	2	18	2	0	0	1	1	3	0	33	60
Fort Worth	1	10	2	6	0	1	1	0	0	5	31
Galveston	0	0	0	0	0	1	0	0	0	0	16
Houston	1	1	1	2	0	5	0	0	0	2	50
San Antonio	0	2	0	1	0	8	1	0	0	0	80
MOUNTAIN											
Montana:											
Billings	1	0	0	0	0	0	0	0	0	0	6
Great Falls	2	0	0	1	0	0	0	0	0	2	10
Helena	0	0	0	0	0	0	0	0	0	0	2
Missoula	0	0	0	0	0	0	0	0	0	0	5
Idaho:											
Boise	0	0	0	0	0	0	0	0	0	0	4
Colorado:											
Denver	10	4	1	0	0	9	1	0	0	28	85
Pueblo	1	1	0	1	0	0	0	0	0	0	2
New Mexico:											
Albuquerque	1	0	0	0	0	4	0	1	0	0	10
Utah:											
Salt Lake City	2	2	0	1	0	1	0	0	0	12	30
Nevada:											
Reno	0	1	0	3	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	9	6	2	0	-------	-------	0	0	-------	4	-------
Spokane	5	6	3	3	-------	-------	0	1	-------	1	-------
Tacoma	2	4	3	3	0	1	1	0	0	1	13
Oregon:											
Portland	5	4	7	28	0	5	0	0	0	0	57
California:											
Los Angeles	23	12	7	10	0	21	2	3	2	45	-------
Sacramento	1	6	1	2	0	3	1	1	0	8	25
San Francisco	14	24	1	1	0	10	1	2	1	12	135

City reports for week ended June 2, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	2	1	0	0	0	0	0	0	0
Springfield	0	0	0	0	0	0	0	1	0
Worcester	0	0	0	1	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	20	11	5	3	0	0	1	1	0
New Jersey:									
Newark	2	1	0	0	0	0	1	0	0
Trenton	1	1	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	1	0	0	0	0	0	0	0	0
Pittsburgh	3	2	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	1	0	0	0	0	0	0	0	0
Cleveland	1	0	0	0	0	0	0	0	0
Toledo	0	0	1	1	0	0	0	0	0
Indiana:									
Indianapolis	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago	8	6	0	0	2	2	0	0	0
Michigan:									
Detroit	5	3	0	0	0	0	0	0	0
Flint	0	1	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee	1	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Missouri:									
Kansas City	6	2	0	0	0	0	0	0	0
St. Louis	9	1	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	0	0	0	0	0	3	1
West Virginia:									
Wheeling	1	0	0	0	0	0	0	0	0
South Carolina:									
Charleston	0	0	0	0	1	0	0	0	0
Georgia:									
Atlanta	0	1	0	0	3	0	0	0	0
Brunswick	0	0	0	0	0	1	0	0	0
Savannah	0	0	0	0	2	2	0	0	0
Florida:									
Miami	0	0	0	0	0	1	0	0	0
Tampa	0	1	0	0	0	0	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	0	1	1	0	0	0
Alabama:									
Birmingham	0	0	0	0	1	0	0	0	0
Mobile	0	0	1	0	0	1	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	0	0	0	0	2	0	0	0	0
Little Rock	0	0	0	0	1	1	0	0	0
Louisiana:									
New Orleans [1]	1	0	0	0	3	1	1	0	0
Texas:									
Dallas	0	0	0	0	3	3	0	0	0
Houston	1	1	0	0	0	1	0	0	0
San Antonio	0	0	0	0	0	2	0	0	0

[1] Rabies (in man), 1 case and 1 death at New Orleans, La.

City reports for week ended June 2, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
MOUNTAIN									
Montana:									
Helena	1	0	0	0	0	0	0	0	0
PACIFIC									
California:									
Los Angeles	0	0	0	0	0	0	1	1	0
San Francisco	2	0	0	0	0	0	0	0	0

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended June 2, 1928, compared with those for a like period ended June 4, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, April 29 to June 2, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927
101 cities	123	183	121	174	137	174	128	171	[2] 122	158
New England	133	130	113	105	110	153	64	160	99	160
Middle Atlantic	170	272	177	282	204	267	213	233	178	234
East North Central	107	159	109	132	114	160	102	145	105	123
West North Central	78	131	55	135	95	105	72	91	84	81
South Atlantic	88	119	82	115	103	110	109	144	[2] 94	126
East South Central	40	76	35	81	20	35	35	96	45	61
West South Central	80	141	92	112	64	50	28	83	56	66
Mountain	80	152	71	99	97	108	71	143	71	179
Pacific	125	110	102	94	120	104	92	196	107	127

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1928 and 1927, respectively.
[2] Greenville, S. C., not included.

Summary of weekly reports from cities, April 29 to June 2, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

MEASLES CASE RATES

	Week ended—									
	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927
101 cities	1,423	696	1,376	602	1,346	620	1,305	548	[1]1,216	447
New England	1,322	270	1,120	346	1,159	416	1,290	435	1,129	314
Middle Atlantic	2,266	212	2,254	297	2,274	323	2,185	365	2,164	282
East North Central	794	564	783	450	680	492	773	372	661	324
West North Central	888	1,522	937	932	1,116	952	939	653	752	459
South Atlantic	2,109	1,577	1,704	1,546	1,436	1,537	1,219	1,358	[1]1,029	1,001
East South Central	1,132	517	1,082	345	1,237	355	1,077	319	1,037	380
West South Central	392	877	336	567	268	620	260	459	176	496
Mountain	752	1,632	1,141	1,500	1,150	906	831	1,049	991	619
Pacific	266	1,601	327	1,259	263	1,215	304	1,060	217	1,094

SCARLET FEVER CASE RATES

101 cities	258	360	253	340	253	309	234	294	[1]207	219
New England	345	393	347	430	292	432	306	365	218	288
Middle Atlantic	303	540	285	474	279	415	267	363	200	255
East North Central	254	283	265	289	272	267	254	301	228	212
West North Central	218	271	242	319	279	289	207	245	232	236
South Atlantic	175	128	167	148	195	101	163	121	[1]180	78
East South Central	304	183	155	152	190	132	219	137	284	101
West South Central	148	58	181	21	216	33	204	25	144	21
Mountain	274	1,004	115	726	133	986	18	897	71	780
Pacific	153	212	204	201	143	167	130	209	148	185

SMALLPOX CASE RATES

101 cities	14	22	18	21	24	26	17	29	[1]13	21
New England	0	0	0	0	0	0	9	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	15	28	20	20	22	37	16	49	10	33
West North Central	31	34	43	26	64	48	27	42	29	24
South Atlantic	14	36	21	38	32	36	26	40	[1]12	32
East South Central	15	56	45	56	30	76	60	61	45	91
West South Central	36	33	8	58	60	17	21	29	24	17
Mountain	106	36	159	9	159	45	133	27	53	36
Pacific	31	73	36	91	54	71	38	84	49	60

TYPHOID FEVER CASE RATES

101 cities	6	10	8	8	6	10	8	9	[1]12	13
New England	2	2	5	5	7	5	11	9	57	9
Middle Atlantic	4	10	2	5	4	6	6	6	1	5
East North Central	3	7	3	3	2	5	5	7	3	7
West North Central	2	2	8	2	2	6	4	4	4	12
South Atlantic	18	18	19	9	7	13	7	18	[1]16	29
East South Central	0	15	20	66	20	56	10	80	66	61
West South Central	28	37	16	25	4	45	12	25	32	87
Mountain	0	18	18	9	0	9	0	18	0	0
Pacific	15	3	31	10	23	10	36	8	18	26

[1] Greenville, S. C., not included.

Summary of weekly reports from cities, April 29 to June 2, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 – Continued

INFLUENZA DEATH RATES

	Week ended—									
	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927
95 cities	32	13	33	13	29	12	25	9	[1] 20	7
New England	21	5	16	14	41	14	18	9	16	2
Middle Atlantic	28	15	31	14	28	10	21	8	24	9
East North Central	30	7	43	10	36	12	33	4	21	4
West North Central	53	8	43	4	18	8	12	12	14	6
South Atlantic	21	16	9	25	16	11	11	13	[1] 9	16
East South Central	84	43	73	32	63	43	89	27	26	5
West South Central	25	13	37	13	16	25	33	25	25	17
Mountain	85	9	27	9	27	9	53	9	44	0
Pacific	7	21	17	7	10	0	7	3	7	3

PNEUMONIA DEATH RATES

95 cities	206	131	210	123	189	110	176	100	[1] 145	93
New England	189	140	257	144	207	100	253	144	172	116
Middle Atlantic	264	166	267	151	218	119	211	116	182	107
East North Central	211	121	232	97	222	104	175	85	130	79
West North Central	128	68	120	70	88	58	84	87	59	58
South Atlantic	184	114	89	128	146	148	119	85	[1] 138	112
East South Central	214	149	193	128	240	112	230	64	204	53
West South Central	90	115	164	140	123	106	144	89	127	81
Mountain	159	99	133	54	97	63	124	36	106	72
Pacific	74	79	98	114	105	121	91	100	71	96

[1] Greenville, S. C., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1928 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central	12	10	2,683,500	2,634,500	2,566,400	2,518,500
South Atlantic	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central	7	6	1,048,300	1,028,300	1,000,100	980,700
West South Central	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain	9	9	591,100	581,600	591,100	581,600
Pacific	6	4	2,046,400	1,996,400	1,548,900	1,512,100

FOREIGN AND INSULAR

PLAGUE ON VESSEL

Steamship "Tymeric"—At Barbados, from New Orleans, for Cape Town, Union of South Africa.—On May 21, 1928, the steamship *Tymeric* from New Orleans arrived at Barbados, British West Indies, with a case of suspect plague on board. The case was reported positive May 29, 1928. The *Tymeric* left New Orleans May 11, 1928, arrived May 21 at Barbados, and sailed same date for Cape Town, Algoa Bay, East London, Port Natal, and Lourenço Marquez.

THE FAR EAST

Report for the week ended May 26, 1928.—The following report for the week ended May 26, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Aden Protectorate—Aden
Egypt—Alexandria, Suez
India—Bassein, Bombay, Rangoon.

CHOLERA

India—Bassein, Calcutta, Madras
Siam—Bangkok
French Indo-China—Haiphong, Saigon

SMALLPOX

Egypt—Alexandria
Iraq—Basra
India—Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon, Vizagapatam
French India—Pondicherry
China—Shanghai, Hong Kong
Japan—Kobe, Osaka, Yokohama
Kwantung—Dairen

Returns for the week ended May 26 were not received from Colombo, Ceylon; Samarinda, Makassar, Belawan-Deli, Padang, nor Tarakan, Dutch East Indies.

ARABIA

Aden—Plague—May 22, 1928—Summary.—On May 22, 1928, a case of plague was reported in the village of Maala, between Crater and Steamer Point, Aden, Arabia. To May 23, 1928, 1,493 cases of plague were reported in Aden, with 1,106 deaths.

CANADA

Provinces—Communicable diseases—Week ended May 26, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended May 26, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever				1	2			3
Influenza	26			17				43
Poliomyelitis					1			1
Smallpox		1		6	3	3	18	31
Typhoid fever	1		10	7		1		19

Quebec Province—Communicable diseases—Week ended June 2, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended June 2, 1928, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Scarlet fever	73
Chicken pox	18	Smallpox	19
Diphtheria	44	Tuberculosis	48
German measles	25	Typhoid fever	10
Influenza	5	Whooping cough	5
Measles	135		

CZECHOSLOVAKIA

Communicable diseases—April, 1928.—During the month of April, 1928, communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	3		Paratyphoid fever	9	
Cerebrospinal meningitis	16	4	Puerperal fever	48	19
Diphtheria	740	53	Scarlet fever	1,287	23
Dysentery	10	3	Trachoma	262	
Malaria	54		Typhoid fever	365	34

JAPAN

Tokyo, city and district—Dysentery—March 25–April 21, 1928.—During the four weeks March 25 to April 21, 1928, dysentery was reported in Tokyo city and district (Prefecture) as follows: Tokyo city—cases, 95; deaths, 35; Prefecture—cases, 138; deaths, 71. Population—city, 1,995,567; prefecture—2,489,577.

LATVIA

Birth and infant mortality rates, 1925, 1926.—In 1925, 41,314 births were recorded in Latvia, and in 1926, 41,073 births, giving birth rates of 22.4 in 1925 and 21.8 in 1926.

The infant mortality was 107 per thousand births in 1925, and 88 per thousand in 1926.

The population of Latvia, according to the census of 1925, was 1,844,805.

LIBERIA

Monrovia—Quarantine service instituted.—Information has been received under recent date showing the appointment of a sanitary officer to have charge of quarantine service for Liberia, and the establishment of a quarantine station on Bushrod Island, vicinity of Monrovia.

MALTA

Communicable diseases—April, 1928.—During the month of April, 1928, communicable diseases were reported in the Island of Malta as follows:

Disease	Cases	Disease	Cases
Bronchopneumonia	11	Puerperal fever	3
Chicken pox	36	Scarlet fever	5
Diphtheria	2	Trachoma	21
Erysipelas	3	Tuberculosis	27
Influenza	29	Typhoid fever	11
Malaria [1]	1	Undulant (Malta) fever	62
Pneumonia	6	Whooping cough	8
Poliomyelitis	1		

[1] Contracted abroad

Population, civil, estimated 228,575

Mortality.—During April, 1928, 342 deaths were recorded in Malta, of which 14 were caused by tuberculosis.

SENEGAL

Dakar—Conference for Study of Disease Control in West Africa.—During the week ended April 28, 1928, medical representatives from several of the West African colonies, met at Dakar, Senegal, for the purpose of studing the clinical characteristics of West African yellow fever and other diseases, their epidemiology and methods for their prevention and control.

The conference was called by the Governor General of the West African Colonies. The following-named countries were represented at the Conference: French Togoland, Gambia, Gold Coast, Nigeria, and Sierra Leone. The Rockefeller Foundation was represented.

It was resolved that a liaison be formed among the West African colonies; that this liaison operate through a central bureau established for the purpose of collecting and assimilating knowledge relative to the occurrence of infectious diseases in the colonies, or, provisionally, by interchange of visits by members of the medical staff of the several colonies; also, that should any colony report the presence of yellow fever or other infectious disease, the medical departments of all the other countries be privileged to send medical representatives to the infected districts to study the disease and its control.

UNION OF SOUTH AFRICA

Cape Province—Natal—Orange Free State—Typhus fever—April 15–28, 1928.—During the two weeks ended April 28, 1928, typhus fever was reported in the Union of South Africa as follows: Fresh outbreaks in ten districts of the Cape Province, in one district of Natal, and in two districts of the Orange Free State. Two sporadic cases occurred in Europeans.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Dec. 18, 1927-Jan. 14, 1928	Jan. 15-Feb. 11, 1928	Feb. 12-Mar. 10, 1928	Week ended— March, 1923			April, 1928				May, 1928			
								17	24	31	7	14	21	28	5	12	19	26
China:																		
Amoy	C	16																
Canton	C	14	12	1					1	1								
	D	14	11	1					1	1								
Foochow	C	P																
Hong Kong	C	P																
Shanghai (settlement and concession)—																		
Foreigners only	C	3																
Including natives	D	7																
Swatow	C	P	P															
	D	P	P															
Tientsin	C	2	P	1														
Dutch East Indies: Java—Batavia	C		28	3														
	D		18	3														
India	C	20,160	23,047	25,139	15,377	12,391	13,236	4,546	5,384	5,856	5,529	7,746						
	D	10,371	12,863	15,026	8,863	6,750	7,282	2,605	2,931	3,182	3,159	4,920						
Bassein	D					1	2		4	25	22	20	6	6	9	9	16	8
Bombay	C		2			1	1	1	1	1								
	D		2				1	1		1	1							
Calcutta	C	101	199	428	176	203	341	164	190	148	162	163	131	152				
	D	64	138	281	125	112	241	94	122	114	112	111	97	105	115	126	102	92
Madras	C	14	13	1	1	2	14		7	1	2	5	5	5	7	7		
	D	8	7	2	1	4	18		2	1	1	4	5	4	5	3		5
Madras Presidency	C	2,050	3,073	3,702	1,864	4,631	2,961	510	455	243	275							
	D	1,055	1,736	2,104	984	2,660	1,618	280	244	131	157							
Negapatam	C					4	4											
	D					6	4					1			1			
Rangoon	C	6	2	8	4	6	29	4	7	8	3	5	10					
	D	5	5	6	3	2	18	2	3	6	5	2	7	6	1			
Tuticorin	C	1		8							10	43	45	19	3			
	D	1	37	14				1			8	26	32	10	3			

India (French):																		
Chandernagor	C		6	10	14	6	5	2	1		4							
	D		6	10	9	1	5	1	1		4							
Karikal	C		1	1	8	32	6					1						
	D		1	1	4	19	5					1						
Pondicherry	C		1	25	11	12	33				1	2	3	2	1			
	D		1	21	12	10	19				1	2	3	2	1			
Indo-China (see also table below):																		
Saigon	C	1			3	4	16	27	13	21	35	50	28	23	15	10		4
	D				1	1	8	19	8	12	20	37	17	12	10	7		2
Iraq [1]																		
Kwangchow-wan (see table below)																		
Siam	C	18	110	88	110	200	295	53	88	70	80	120	85					
	D	11	76	64	80	139	214	39	67	54	58	84	61					
Bangkok	C	5	4	3	21	101	60	8	12	16	24		30	24	20	17	14	11
	D	3	2	2	11	66	36	5	5	12	11		13	14	8	6	9	7
Straits Settlements: Singapore	C		7	5	23	3		1	1					1				
	D		5	4	12	1		1	1					1				
On vessel:																		
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C										11							
S. S. Tabaristan: At Basra, Iraq	C	1																

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths, Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths, Diyalah Liwa, 1 case, 1 death; Duliam Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928			March, 1928			April, 1928			May, 1928
							1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Indo-China (French) (see also table above):																
Annam	C	3,179	226	126	18	267	23	36	14	18	18	23	17	11	13	4
Cambodia	C	251	180	85	72	54	38	22	51	33	22	92	43	102	51	34
Cochin-China	C	469	178	100	113	295	178	113	153	206	217	245	277	316	240	140
Laos	C	246	67	10												
Tonkin	C	1,297	1		2	1							1	4	1	9
Kwangchow-Wan	C	16														

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14	April, 1928 21	April, 1928 28	May, 1928 5	May, 1928 12	May, 1928 19	May, 1928 26	June, 1928 2	June, 1928 9
Algeria (see also table below):																				
Algiers	C														1					
Oran	C		2													1				2
Arabia: Aden	C				19	178	343	139	148	151	163	108	59	53	13	5	1	1		
	D				7	104	206	134	135	134	126	97	48	16	16	7	1	1		
Plague-infected rats						P	P													
Argentina:																				
Avellaneda	C																		1	
	D																		1	
Bahia Blanca district	C			3																
Buenos Aires [1]	C					2										(1)	6			
	D																3			
Cordoba Province	C	P	P	10	2							5								
Entre Rios	C																			2
Firmat	C			1																
Loreto	C																		3	
Quilino	C			3																
Rosario	C			4	5	4	1													
Santa Fe	C																			7
Santiago del Estero	C						1													9
Suardi	C							[illegible]											2	
Ucacha	C			1																
Azores: St. Michaels Island	C	3	3	3	2	8	3	1	1		1		2	1						
	D	1		1	1	4	1	1			1		1	1						
Brazil:																				
Bahia	C				4	5	8			P	2	1								
	D				4	4	5													
Porto Alegre	C						2													
Rio de Janeiro	C					4	3	2	1											
	D					1	2	2	1											
Plague-infected rats						1														
British East Africa (see also table below):																				
Tanganyiki	C	P	P	P	P	2	3													
	D					2	3					5								
Uganda	C	99	99	67	79	23	13													
	D	88	96	61	64	18	10													

Canary Islands:																				
Arrecife	C																1			
	D																1			
Las Palmas	C	9		3	3	1	1	2		2										
	D			1	1	1	1													
Teneriffe	C						10													
	D						4													
Ceylon: Colombo	C	1		6	7	3	11	3		4					1	1	2			
	D			6	6	2	6	3		2					1	1	1			
Plague-infected rats			3		2	5	6													
China:																				
Hong Kong	C														2					
Tungliao	D	95																		
Dutch East Indies:																				
Balik-Papan	C				1															
	D				1															
Celebes—Makassar	C		6	2	6	5	1													
	D		6	2	5	5	1													
Java	D	779	829	1,017	754	737	454													
Batavia and West Java	C	130	132	154	128	137	103	19	18	17	26	13	10	14						
	D	129	132	152	128	135	103	19	18	17	26	13	10	14						
Cheribon	C			1																
	D			1																
Plague-infected rats								1		1	1	1	3	2	1	1	4			
East Java and Madura	C	17	10	8	7	7		1	1	2		1	2							
	D	17	10	8	7	7		1	1	2		1	2							
Kedoe Residency	C											P								
Pasberoean Residency	C			P																
Surabaya Residency	C			P						1					1					
	D									1					1					
Surakarta Residency	C		P	P																
Ecuador: Guayaquil[1] (see table below).																				
Egypt:																				
Alexandria	C			12	5	2	1											1		
	D			7	2	2	1											2		
Beni-Souef	C													4	8	4	14	34	17	
	D													1	2	4	6	8	5	
Cairo	C				2															
	D				2															
Maghagha District	C												1							
	D												1							
Menufia	C																	6	5	
	D																		2	
Minieh Province	C												32	9	7	13	15	36	12	
	D												5	4		5	2	9	1	
Suez	C				1	4	13		4	7	3		3	2			1	2		
	D				1	2	9		2	3	4		2	2			1			
Plague-infected rats									2											
Tanta	C																1			
	D																1			

[1] 6 cases of plague reported in Buenos Aires, Argentina, before May 14, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14	April, 1928 21	April, 1928 28	May, 1928 5	May, 1928 12	May, 1928 19	May, 1928 26	June, 1928 2	June, 1928 9
Greece:																				
Athens and Piræus	C	1			3															
	D	1			1															
Mitylene	C	1	3	3																
Patras	C	1	1																	
	D	1	1																	
Hawaii Territory: Hawaii	D						1													
India	C	3,246	3,600	5,518	7,097	12,652	23,174	7,517	6,077	6,634	5,851	6,690								
	D	1,792	2,065	3,269	4,925	8,521	16,998	6,031	4,724	5,372	4,780	5,911								
Bassein	D	8	4	4	17	8	12	5	5	7	5	4	5	1	3	2	1			
Bombay	C	4			3	14	33	4	16	28	21	17								
	D	3			3	9	33	4	11	25	21	15	14	19	21	17	14			
Calcutta	C				2															
	D					1					2									
Madras Presidency	C	583	470	791	550	452	271	25	19	13	5	14	6							
	D	298	282	359	206	256	212	18	16	9	5	7	5							
Rangoon	C	11	11	15	17	35	48	5	11	3	11	5	2							
	D	11	11	15	16	30	43	4	9	5	8	5	1	3	5	3	3			
Indo-China (see also table below):																				
Saigon	C		1																	
Iraq:																				
Baghdad	C					4	2	2	2	1		1	4	4	2	4	3	4	2	
	D					2	2	2	2	1		1		4	1		1	1	1	
Plague-infected rats														4		3				
Dulaim Liwa	C					1						1								
Kwangchow-Wan (see table below)																				
Madagascar (see table below)																				
Mauritius (see table below)																				
Nigeria (see also table below):																				
Lagos	C		17	13	10	10	8	2		2	3	2	6	7	2	4	8	6		
	D		17	13	8	11	8	2		2	2	2	7	7	2	4	8	6		
Peru (see table below)																				

Senegal (see table below):																				
Baol	C	95	P	P																
	D	40																		
Cayor	C	176	48																	
	D	88	28																	
Dakar	C	1																		
Louga	C	8																		
Thies and vicinity	C	1	1							8										
	D									4										
Siam	C	13	1	3	16	20	42	7	8	13	5	6	11	5						
	D	9		2	11	12	36	6	9	10	5	4		5						
Bangkok	C	2			1	2	1			1			3	1						
	D		1		1	2	1			1			2							
Straits Settlements: Singapore	C		1			1	3		1											
	D		1			1	2		1											
Syria (see table below)																				
Tunisia [3]																				
Turkey: Constantinople	C	1		2																
	D	1		1																
Union of South Africa:																				
Cape Province	C		2	2		1														
	D		2	1		1														
Orange Free State	C		1	8		5	5	3	2											
	D		1	6		4	1	3	2											
Union of Soviet Socialist Republics:																				
Chita district	C	1																		
	D	1																		
Northern Caucasus	C	1																		
Venezuela: State of Miranda—Tacata and Cua	C						P													
On vessel:																				
S. S. Cadwallen, at La Plata, from Rosario, Argentina	C				1															
S. S. Aghios Gerasimos, at Vigo, Spain	C		3																	
S. S. Tymeric, at Barbados from New Orleans	C																	1		

[3] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1923.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928
Algeria (see also table above):								
Algiers	C		2					1
Angola	C		3					
British East Africa (see also table above):								
Kenya	C	95	62	26	24	19	17	
	D						5	
Ecuador: Guayaquil	C	15	18	4	6	10		
	D		5	4	3	1		
Plague-infected rats		34	31	23	31	21		
Indo-China (French) (see also table above)	C	14	10	7		5	9	10
Kwangchow-Wan	C					18	17	
Madagascar	C	314	692	427	342	171		
	D	286	605	388	317	159		
Ambositra Province	C	7	25	105	67	30		
	D	7	17	96	66	29		
Antsirabe Province	C	39	109	117	108	56		
	D	38	108	117	108	54		

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928
Madagascar—Continued.								
Itasy Province	C	36	104	33	19	3		
	D	41	94	29	17	3		
Moramanga Province	C	12	95	19	25	12		
	D	12	83	19	24	12		
Tananarive Province	C	211	408	155	123	70		
	D	189	354	129	102	61		
Mauritius	C	1						
Nigeria (see also table above)	C	32	63	16	16			
	D	29	61	16	16			
Peru	C	34	34		41	52		
	D	19	11		14	9		
Callao	D	3	3					
Lima	C		7	6				
	D		3					
Senegal (see also table above)	C			5	17	8	81	14
	D				13	4	40	5
Syria: Beirut	C		2					

PLAGUE RATS ON VESSELS

S. S. *Modemi* at Goteborg, Sweden, from Bahia and Buenos Aires, via Cape Verde Islands, December 22, 1927.
S. S. *Gydavore* at Landskrona, Sweden, from Rosario, via Canary Islands, January 22, 1928.
S. S. *Dryden* at Liverpool, from La Plata River ports, January 20, 1928

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928			April, 1928				May, 1928				June 2, 1928
								17	24	31	7	14	21	28	5	12	19	26	
Algeria (see also table below)	C	683	661	170	129	71	72	3				12							
Algiers	C			3	9	15	10		2	2	1		2		2	1	1		
Oran	C	11	20	39	29	11	5		2	10		3	1	2	11	4	1		
Angola (see table below).																			
Arabia: Aden	C		1	3	1		1												
Brazil (see also table below):																			
Rio de Janeiro	C		1					1											
	D		1					1											
British East Africa (see also table below):																			
Kenya—Mombasa	C								1		1								
Tanganyika	D	P	P	P	8	5													
British South Africa:																			
Northern Rhodesia	C	164	185	252	236	233	297		54	8	5	26	7	4					
	D	11	64	62	31	23	42		9			1	1	1					
Southern Rhodesia	C		3	2	1	3	7	4	1	2		21	3						
	D						1					10							
Canada:																			
Alberta	C	23	10	10	11	27	10	7	20	7	13	4	2	3	3	13	10	5	
Calgary	C							1											
Edmonton	C	1	1	8	5	3	13	1	11	1	7	2			1	12	10		
British Columbia—Vancouver	C			4	8	26	10	2	5	6	4	11	6	1	6	4	2		
Manitoba	C	7	19	7	11	1									7				
Winnipeg	C	2	2	2	2	2													
New Brunswick	C				1		1										1		
Nova Scotia:																			
Halifax	C	1																	
Ontario	C	96	264	347	212	243	147	19	35	20	9	6	18	18	8	15	12		
Hamilton	C			2															
Kingston	C		1		1	1						2		1					
Ottawa	C	67	134	63	60	68	22	6	8	10	2		3	1		4	2		
Toronto	C	10	34	39	28	20	14	2	3	3	1	2	4	4	1	2	7		
Windsor	C	9																	
Quebec	C	8	25	16	44	28	54	22	40	35	15	21	25	4	33	13	31	15	
Montreal	C		1		8	8	9	6	3				6	2	1			1	2
Quebec	C			4	10	16	13	3	2	4	1	3	7	5	8	7	17	9	14
Riviere du Loup	C		3																
Sherbrooke	C									3									

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	24	31	April, 1928 7	14	21	28	May, 1928 5	12	19	26	June 2, 1928
Canada—Continued.																			
Saskatchewan	C	31	34	58	52	97	22	14	7		12	2	23	15	12	12	13		
Moose Jaw	C	3		1	4	11	13	2	5			3					1		
Regina	C	5	1	1						1	2	3	2		3	1			
Saskatoon	C			2	4	15	2												
Ceylon: Colombo	C		1	2		4	6				1								
	D			1		1			1										
China:																			
Amoy	C						1	1	2	1	2	3	2	1	3	1			
Antung	C				1								1		2				
Canton	C						2	3	2		2	1				1		1	
Chefoo	C	P		P				P											
	D						1												
Foochow	C	P	P	P	P	P	P				P	P	P	P	P				
Hong Kong	C				1	2	7	5	7	10	10	4	4	9	8	8	10	3	
	D				1	2	4		2	5	12	7	2	10	7	11	5	4	
Manchuria—																			
Changchun	C			1		4						2		1	1	3			
Dairen	C	1	2	1	5	15	13	1	3	5	6	7	3	6		12	10	13	
	D	1				8	7		3	5									
Fushun	C		1																
Harbin	C			2	1	5	7	2	3		2	2	3	2					
Mukden	C	2	1			4	21			1			3	1					
Pensihu	C	1																	
Shanghai—																			
Foreigners only	C					5	6	1	1	3	2		1	1	1	2			
Including natives	D					11	19	2	1	3	3	3	1	3	2	1	7	5	
Tientsin	C	13	8	9	8	48	20	4	3	3	3	9	1	3	4				
Chosen (see table below)																			
Curacao (alastrim)	C					2	3												
Dominican Republic: Santo Domingo	C							2							1				
Dutch East Indies:																			
Borneo—																			
Pontianak	C						1												
Samarinda district	C		P																
Java—																			
Batavia and West Java	C	4	25			4	2	4			1	1							
	D		15																

East Java and Madura	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					[illegible]							
	D	1					1												
Sumatra—Medan	C			3	9	23	14	6			1	2			2				
	D			2	3	11	2	4			1	2			1				
	D	1		1							33	6							
Ecuador (see table below)																			
Egypt	C			4	4	1	2				52	11		1		1			
	D	1		1							33	6		1				1	
Cairo	C			2		1													
France (see table below)																			
Gold Coast (see table below)																			
Great Britain:																			
England and Wales	C	473	902	1,041	1,175	1,530	1,473	359	342	322	318	321	326	376	321	319	336		
Birmingham	C	1				44	3	1				1							
Bradford	C		11	19	32	24	12	9		5	5	3	2	7	2	2	7	2	
Bristol	C	6	4	8		3	4		2	8	2	1	10	1	5	4	1		
Cardiff	C		1		1					5				1	2		1		
Castleford	C						4	2	16	7	11	27	11	20	11	11	6		
Leeds	C	7	5	16	11	3	9	3	5	3	3	2	2	1	1				
Liverpool	C				1		1												
London	C					4	14	10	5	1	1	7	5	3	27	5	10		
Manchester	C	3	6	25	5	25	8	4	3	3	4	2	4	2		1	1		
Newcastle on Tyne	C	6	9	55	22	27	12	3	4		2			4		1	6		
Nottingham	C				13	27	11	5	1	6	1	4	4	6	3	5	10		
Sheffield	C	10	6	9	14	8	6				1		10	2	2	2			
Stoke on Trent	C				4	1	15	11			1	4	10	5	13	9	8		
Greece (see table below)																			
India	C	3,153	4,052	6,731	10,676	17,777	18,850	6,004	6,169	8,101	7,760	8,789							
	D	715	927	1,650	2,429	3,709	3,826	1,212	1,207	1,500	1,621	1,988							
Bassein	C					1									1				
Bombay	C	10	4	9	14	61	149	49	58	62	49	56	57	54	33	46	37	26	
	D	2	3	2		24	73	24	33	36	27	32	34	27	25	25	22	18	
Calcutta	C	5	5	25	36	58	71	20	29	45	40	49	51	31	40	41	29	31	
	D	6	2	11	27	34	50	15	21	33	35	32	42	21	35	30	26	23	
Karachi	C						1	1							2				
	D						1								1				
Madras	C	8	7	11	21	74	100	30	27	45	81	49	36	60	24	17	22	11	
	D		2	3	6	8	19	5	3	6	15	16	8	7	7	5	5		
Negapatam	C				5	8	3					1		5	1	3	4	1	
	D				3	3						1		2			1		
Rangoon	C	17	6	14	136	275	377	96	82	92	50	62	45	37	23	15	2	6	
	D	3	1	4	31	64	104	28	17	34	23	24	17	12	16	4	2	2	
Tuticorin	C															3			
Vizagapatam	C				3	10	2			3			2			2		1	
	D					8												1	
India (French):																			
Chandernagor	C										5								
	D										1								
Karikal	C	2	P																
	D	2																	
Pondicherry	C	38	42	41	65	47	9		6	5	7	12		15	9	16		7	
	D	38	42	41	50	47	9		6	5	7	12		15	9	16		6	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	24	31	April, 1928 7	14	21	28	May, 1928 5	12	19	26	June 2, 1928
Indo-China (see also table below):																			
Saigon	C			1	3		3												
Iraq:																			
Baghdad	C	7	5	25	23	19	7	3	1		1	1	3		1	6		3	
	D	4	4	14	12	11	4	3	1			1	1		1	1		2	
Basra	C	2	3	4	2	1	7	4	1				1	1	2		1	2	
	D	2	1	3	1			1	1				1	1			1	2	
Italy:																			
Leghorn	C						1	1											
Palermo	C									3	2	1	3	3	3	2			
Rome and vicinity	C					3													
Jamaica (outside Kingston) (alastrim)	C	9	7	3	2	5	10	3	2	1	7		1	2	1			1	
Kingston (alastrim)	C	2																	
Japan:																			
Kobe	C																6	3	
Nagoya	C													1	5	2			
Tokyo	C					4	4	1	3	1	10	8							
	D					1	2				1	1							
Tokyo Prefecture	C								17	5	2	1							
	D										1	1	1						
Yokohama	C													1	1	1		1	
Latvia (see table below).																			
Mauretania	C						P												
Mexico (see also table below):																			
Acapulco	C		1																
	D		1																
Chihuahua	D				1														
Jalisco (State)	C						P	P	P	P	P	P	P	P					
Guadalajara	D			2			1				2	2	1	4	5	7	4		2
Manzanillo	D				1			1											
Mazatlan	D																2		
Mexico City and surrounding territory	C			4		2	2							1		1			
Saltillo	D															1	1		
Tampico	C						1												
Torreon	D	2																	

Morocco (see table below):																			
Nigeria (see also table below):																			
Lagos	C										1								
Southern Provinces	C						7		40	26	27								
	D								28	1	6								
Palestine: Jerusalem	C			1		1													
	D					1													
Persia (see table below).																			
Poland	C			1	6	3	1	1					5	2	2				
	D												1						
Portugal (see also table below):																			
Lisbon	C	8	4	10	12	12	20			2	3		3	2	1				
	D			1			1												
Oporto	C													1					
Senegal (see also table below):																			
Dakar	C						34	17			12	5	11			12			
	D							12			8		8			4			
Siam	C	6	1	9	23	35	12		2	14	12	1							
	D			1	2	4	3			4		1							
Bangkok	C		1	1	3														
	D				1														
Spain (see also table below):																			
Malaga	D		1	1															
Seville	C				1														
Valencia	C	1			2		1		1	1									
Straits Settlements: Singapore	C		1			1	1	1					1						
Sudan (Anglo-Egyptian)	C				4	85	109	10	28	250	54	29	18	78	35	39	7		
	D				4	48	27	7	8	75	10	6	8	4	14	4	1		
Sudan (French) (see table below).																			
Switzerland	C				2														
Syria (see table below).																			
Tunisia: Tunis	C				4	3	14	1		1	2		4		2				
Union of South Africa:																			
Cape Province	C	P				P													
Natal	C					P	P	P	P	P									
Orange Free State	C		P	P	P	P				P									
Transvaal	C	P	7																
Union of Soviet Socialist Republics (see table below).																			
Upper Volta	C						5		2			P		4	5				
Venezuela:																			
Maracaibo	D	1				1	1												
On vessel:																			
S. S. Arendskerk at Singapore, from Amoy, China	C									P									
S. S. Kashgar at Kobe, from Shanghai	C														P				
S. S. Rohna at Penang from Negapatam	C																	P	
S. S. Tjileboct at Hong Kong, from Shanghai	C														P				
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C										1								

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July-September, 1927	October, 1927	November, 1927	December, 1927	January, 1928	February, 1928			March, 1928			April, 1928			May, 1928	
							1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Algeria (see also table above)	C	1,217	682														
Oran	C	51	11														
Indo-China (French) (see also table above)	C	68	25	38	34	58	50	31	90	57	71	69		35		36	
Senegal (see also table above)	C													51			
	D													7			
Sudan (French)	C					4		5	1	P	5			4		30	P
	D															6	
Syria:																	
Aleppo	C				1	1											
Beirut	C				2	15	11	26		12	7	4	3	5	1	2	3
	D											2	1				
Damascus	C		22	13	12	13					1						

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Angola	C	51	151	10	36		
	D		2				
Congo	C	5	77		36		
Cuanza-Norte	C	1					
Cuanza-Sul	C		9	10			
Loanda	C	1					
Zaire	C	3	5				
Brazil (see also table above):							
Porto Alegre	C	11	5		1		
British East Africa (see also table above):							
Zanzibar	C		2				
	D		1				
Chosen	C	21	4	4	21	23	
	D	6	1	2	8	6	
Seoul	C					1	
Ecuador: Guayaquil	C	4	6	2	9	24	19
	D						
France	C	37	25	11	10	13	6

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Gold Coast	C	7	4		1	3	
Greece	C	10	9	6	11	19	
	D				2	2	
Latvia	C		2		1		
Mexico (see also table above)	D	221	346	256			
Morocco	C	180	622	55	47	30	19
Nigeria (see also table above)	C	820	316	275	217		
	D	173	81	39	45		
Persia	D		2	7			
Portugal (see also table above)	C			143	115		
	D			22	8		
Spain (see also table above):							
Madrid	D		1				
U. S. S. R.:							
Railways, etc	C	26	33	18	20		
Other territories in Europe	C	366	1,256		998		
Transcaucasus, Siberia, and Central Asia	C	80	81				
Ukraine	C	27	48	6	11		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14	April, 1928 21	April, 1928 28	May, 1928 5	May, 1928 12	May, 1928 19	May, 1928 26	June 2, 1928
Algeria (see also table below):																					
Algeria	C							1	3	1	1	2	5	1	3			1	1		
	D								1						2						
Oran	C						4	2	10	1		2	1	1	6	2	2	1			
	D														1						
Austria: Vienna	C							1													
Bulgaria (see also table below).																					
Sofia	C			17	6	1	6	1		3		3	14				1	1			
	D				1																
Chile:																					
Antofagasta	D			1																	
Talcahuano	D		1								1										
Valparaiso	C		1		1	2	1		1												
	D	2	1		2																
China (see also table below):																					
Manchuria—																					
Dairen	C													7		3					
Harbin	C	2			1										1	1					
Tientsin	C		2																		
Chosen (see table below)																					
Czechoslovakia (see table below)																					
Egypt	C	2		12	4	14	8	9	17		1	1		2	1						
	D	3		5		8	4	2	8		1										
Cairo	C					3							2	3			1				
	D					3							1	3			1				
Port Said	C			1		1															
Behera Province	C												29	23			2	7	5		
	D													4				3	1		
Gharbieh Province	C												23	5		5		1			
	D													3		2					
Keneh Province	C												5	29		9					
	D													1		6					
Menoufieh	C															5	23	5			
	D															1	2				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths, P, present]

Place		July 31–Aug. 27, 1927	Aug. 28–Sept. 24, 1927	Sept 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	March, 1928 24	March, 1928 31	April, 1928 7	April, 1928 14	April, 1928 21	April, 1928 28	May, 1928 5	May, 1928 12	May, 1928 19	May, 1928 26	June 2, 1928
Greece (see table below)																					
Ireland (Irish Free State)	C							1						1							4
Cork County	C					3	1														
Donegal County, Letterkenny	C			4																	
Japan (see table below)																					
Latvia (see table below)																					
Lithuania (see table below)																					
Mexico (see also table below):																					
Guadalajara	D					1															
Mexico City, including municipalities in Federal District	C	17	19	18	28	17	15	5	8	6	6			4		4					
	D				2	1	5		4		3					1					
Monterey	D										1										
Morocco (see table below)	C						32	1,051	316	172	167	219	190	186	167	136	102	62	63		
Palestine	C	11	1	5	3	9	8	5	10	5			2	3		1	2	2	1	1	
Peru (see table below)																					
Poland	C	50	35	19	64	93	195	346	265	90	90	125	77	93		71	80				
	D	6	2	4	11	10	16	19	26	5	6	7	7	8		2	2				
Portugal (see table below): Oporto	C	1			1			1													
Rumania	C	36	16	17	22	35	68	39	68	29	34	33	45	36	38	30	38				
	D	1		2			3	9	5	2	2	3	4		6	5	1				
Syria (see also table below): Aleppo	C		2				2														
Tunisia	C	14		3	1	1	6	4	1	13		5			2	16	1	3			
Union of South Africa:																					
Cape Province	C	P	P	P	P	P	1	1	P		P	P	P	P	P	P					
Natal	C	P	P	P	P	2	3	1	2	P	P	P		P	P	P					
Orange Free State	C			P		P		P			P	P	P	P	P	P					
Transvaal	C	1		5	P	P					P	P									
Union of Soviet Socialist Republics (see table below)																					
Yugoslavia (see table below)																					
On vessel: S. S. Gaika at Durban, Natal, from Mauritius	C								1												

Place		1927 July-September	1927 October	1927 November	1927 December	January, 1928 1-10	January, 1928 11-20	January, 1928 21-31	February, 1928 1-10	February, 1928 11-20	February, 1928 21-29	March, 1928 1-10	March, 1928 11-20	March, 1928 21-31	April, 1928 1-10	April, 1928 11-20	April, 1928 21-30	May 1-10 1928
Algeria (see also table above)	C	110	12															
	D	13	1															
Algiers	C	10	2															
Bulgaria (see also table above)	C	43	2		2	7	6		8	12	6							26
	D	3	1		1		1		1	2	2							
Morocco (see also table above)	C	231	11	26	86													

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
China (see also table above):							
Shanghai	D		1				
Chosen	C	90	80	183	400	313	
	D	8	6	19	44	25	
Chemulpo	C	3		1		1	
Gensan	C	2		1			
	D			1			
Seoul	C	5	2			10	
	D	1	1			1	
Czechoslovakia	C	12	7			25	
Greece: Athens	C	3	1	2	2		13
	D						2
Japan	C	1	1				
Latvia	C	6			1	26	
Lithuania	C	69	54	86	137		
	D	14	3	10	12		

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
Mexico (see also table above)	D	64	98	46			
Peru							
Arequipa	D	3	3	2			1
La Oroya	C			P	P	P	
Lima	C	8					
Turkey	C				17		
	D				1		
Union of Soviet Socialist Republics:							
Railways, etc	C	77	102	41	107		
Transcaucasus, Siberia, and Central Asia	C	208	190	7			
Ukraine	C	295	631	533	459		
Other territories in Europe	C	1,839	1,924		1,853		
Yugoslavia	C	20	2	7	24	3	10
	D	5		3			1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C, indicates cases; D, deaths; P, present]

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Dec. 18, 1927-Jan. 14, 1928	Week ended— January, 1928: 21	January, 1928: 28	February, 1928: 4	February, 1928: 11	February, 1928: 18	February, 1928: 25	Mar. 3, 1928
Belgian Congo:															
Boma	C							3							
	D							2							
Matadi	C							29	1	5	8			1	
	D							16	2	5	6				
Brazil:															
Bahia [1]															
Estancia															1
Rio de Janeiro [1]	C														
Dahomey:															
Grand Popo	C						1								
	D						1								
Porto Novo	C	1													
	D	1													
Gold Coast (see also table below):															
Ashanti—															
Obuasi	C		1												
	D		1												
Ivory Coast	C	1						1							
	D	1						1							
Liberia: Monrovia	C			1											
Nigeria	C			2											
	D			2											
Senegal	C	3	10	21	31	38									
	D	3	9	21	31	28									
Dakar	C	1			12	14	7	2							
	D				7	10	7	2							
Togoland	C		1												
	D		1												

Place		July	August	September	October	November	December	January	February	March	April	May
Gold Coast (see also table above)	C	15	2	6	1							1
	D	4	2	4	1							

[1] Two deaths from yellow fever and two suspected cases were reported at Rio de Janeiro, Brazil, June 4, 1928. The disease was said to have been imported from the north. Three cases of yellow fever were reported at Bahia, Brazil, June 20, 1928.

TREASURY DEPARTMENT

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SPECIAL ARTICLES

Unit for Scarlet Fever Streptococcus Antitoxin
Current World Prevalence of Communicable Diseases
Summaries of Recent State Mortality Statistics

UNITED STATES
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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg Gen. R C. WILLIAMS, *Chief of Division*

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PUBLIC HEALTH REPORTS

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A UNIT FOR SCARLET FEVER STREPTOCOCCUS ANTITOXIN[1]

By R. E. DYER, *Surgeon, United States Public Health Service, Assistant Director, Hygienic Laboratory*

During the past few years several methods of testing the potency of scarlet fever streptococcus antitoxin have been tried. Dick and Dick (1) (2) (3), whose work furnishes the basis of the unit here suggested, tested the neutralization of scarlet fever streptococcus toxin by the antitoxin by means of a skin test on human beings; and Wadsworth, Kirkbride, and Wheeler (4) applied this method to the skin of goats. Dochez and Sherman (5) and Blake, Trask, and Lynch (6) (7) measured the antitoxic potency of serums by determining the smallest volume of the antitoxin which, when injected intracutaneously in the area of the rash in an early case of scarlet fever, would produce local blanching (Schultz-Charlton reaction). O'Brien (8) and Okell (9) tested the activity of antitoxins in producing passive immunity in individuals who were susceptible to the toxin of *Streptococcus scarlatinae*, while Parish and Okell (10) compared the potency of antitoxic serums in protecting rabbits against the septicemia produced by inoculation with broth cultures of the scarlet fever streptococcus. Dyer (11), Povitsky (12), Eagles (13) and others have attempted to apply the Ramon flocculation test, which has been employed for testing other antitoxins.

Of the methods cited, those based on testing the potency of antitoxin in neutralizing toxin as shown by skin tests have been used more extensively than any others, and seem to be the most useful. In these methods, as in methods early in use for testing other antitoxins, a fixed amount of a toxin is mixed with different amounts of antitoxin. The amount of toxin used in the mixtures is spoken of as the test dose and, in the case of the scarlet fever streptococcus toxin which we have used, contains five skin test doses—a skin test dose being the amount of toxin necessary to produce a reaction at least 1

[1] EDITORIAL NOTE.—The Permanent Commission on the Standardization of Sera, etc., of the Health Organization of the League of Nations has selected as a basis for study the standard scarlet fever streptococcus serum here described. The report of the commission (Frankfort-on-Main, Apr. 25 to 28, 1928) states:

"Without expressing an opinion on the etiology of scarlet fever or on the methods of testing sera prepared with the products of culture of hemolytic streptococci isolated from cases of scarlet fever, it would be useful to render future researches along this line more readily comparable. To this end, the standard serum adopted by the Federal Government of the United States may be selected as a basis for study, the Hygienic Laboratory has agreed to place at the disposition of the Health Organization of the League of Nations a sufficient quantity of the standard serum."

centimeter in diameter about 24 hours after intracutaneous injection in the majority of individuals susceptible to scarlet fever (1) (14). In using such a method it has been found that a great deal depends on the test subject, due to differences in susceptibility of individuals. In some individuals a certain volume of antitoxin when mixed with a given amount of toxin will show neutralization, while on other subjects several times as much antitoxin may be required to neutralize the same test dose of toxin.

Protocol I illustrates wide variations encountered in attempting to titrate an antitoxin against the toxin.

PROTOCOL I

Illustrating conflicting results obtained in testing the potency of scarlet fever streptococcus antitoxin by the toxin neutralization method without a control serum [1]

Case No.	Toxin [2]	Antitoxin					
	One skin test dose	1/10,000 c. c. [3]	1/10,000 c. c. plus toxin—one skin test dose	1/20,000 c. c. plus toxin—one skin test dose	1/30,000 c. c. plus toxin—one skin test dose	1/40,000 c. c plus toxin—one skin test dose	1/50,000 c. c. plus toxin—one skin test dose
659	+	0	0	0	0	0	0
418	+	0	0	0	0	0	+
519	+	0	0	0	0	+	+
608	+	0	0	0	+	+	+
529	+	0	0	+	+	+	+
555	+	0	+	+	+	+	+

[1] The same toxin and the same antitoxin were used throughout these tests.
[2] Toxin control
[3] Serum control.
0 = Negative reaction.
+ = Positive reaction.

From the foregoing protocol the necessity for some means of eliminating irregularities in results due to the varying susceptibility of subjects is obvious. It would seem that this could be accomplished best by a method similar to that used in the present official standardization of other antitoxins—that is, by the establishing of a standard serum as the fixed basis with which the antitoxins to be tested could be compared. To serve this purpose a serum was selected and dried to insure stability. The redissolved serum was then carefully titrated against the previously selected test dose of toxin on a sufficient number of subjects to determine the reciprocal neutralizing value of the serum and the toxin, one against the other. In applying the standardization test in practice, a range of doses of the standard serum are mixed each with a test dose of toxin and injected intracutaneously. On the same subject, at the same time, a range of doses of the antitoxin to be tested, mixed with the same test dose of toxin, are injected. Thus, the volume of a new antitoxin is determined which will neutralize one test dose of toxin on a given subject, and this volume is compared with the volume of the standard control serum

which also shows neutralization of one test dose of toxin on the same subject at the same time. As the neutralizing value of the standard serum is known, the potency of the new antitoxin may be calculated readily. Thus, if, on a certain individual, 1/400 of a cubic centimeter is found to be the smallest volume of the standard serum which will neutralize one test dose of toxin, and 1/6,000 of a cubic centimeter of a new antitoxin also shows neutralization of one test dose of toxin, then the new antitoxin is 15 times as strong as the standard serum.

It seems desirable that the definition of the potency of scarlet fever streptococcus antitoxin should be expressed in terms of "units" as with other antitoxins in common use. To avoid confusion, possibly arising from different-sized doses of similar products, it also seems desirable that the average therapeutic dose of scarlet fever streptococcus antitoxin should be approximately the same as that of diphtheria antitoxin, the doses of both being expressed in units. It has been found by clinicians that the average therapeutic dose of scarlet fever streptococcus antitoxin should contain enough antitoxin to neutralize from 300,000 to 500,000 skin test doses of toxin. Establishing as a unit 10 times the smallest amount of the standard serum which has been found necessary to neutralize one test dose of toxin, each test dose representing five skin test doses, the therapeutic dose of the antitoxin will approximate in number of units the average dose of diphtheria antitoxin.

The standard scarlet fever streptococcus serum is kept at the Hygienic Laboratory under the same conditions of storage that have been maintained with the standard diphtheria and tetanus unit serums for several years, during which time no measurable deterioration has taken place in the latter serums.

A definite amount of this standard serum is therefore suggested as a permanent unit. This unit has been selected to equal 10 times the smallest amount of scarlet fever streptococcus antitoxin necessary to neutralize one test dose of toxin, but the designated amount of serum, and not the toxin dose, is the final measurement of reference; that is, the unit will remain the same without regard to the dose of toxin used from time to time for comparing the standard with other antitoxins, or the method of test employed. The standard serum as dissolved at present contains 40 such units per cubic centimeter.

Protocol II illustrates the results of tests to determine the toxin neutralizing potency of a new antitoxin in comparison with the standard serum.

PROTOCOL II

Potency test on scarlet fever streptococcus antitoxin Lot X

Case	Hour of reading	Antitoxin X: 1/4,000 c. c.[2]	Antitoxin X: 1/4,000 c. c. plus one test dose of toxin	Antitoxin X: 1/5,000 c. c. plus one test dose of toxin	Antitoxin X: 1/6,250 c. c. plus one test dose of toxin	Antitoxin X: 1/7,800 c. c. plus one dose test of toxin	Hygienic laboratory standard serum lot C[1]: 1/400 c. c.[2]	Hygienic laboratory standard serum lot C[1]: 1/400 c. c. plus one test dose of toxin	Hygienic laboratory standard serum lot C[1]: 1/500 c. c. plus one test dose of toxin	Hygienic laboratory standard serum lot C[1]: 1/625 c. c. plus one test dose of toxin	Hygienic laboratory standard serum lot C[1]: 1/780 c. c. plus one test dose of toxin	Toxin,[3] one skin test dose	Number of units per c. c. of antitoxin Lot X
480..	24	0	0	0	0	0	0	0	0	0	0	15x17	500.
	48	0	0	8x7	8x11	8x11	0	7x8	8x10	7x11	12x14	0	
324..	24	0	0	0	0	3x3	0	3x3	3x6	5x5	7x9	20x25	500.
	48	0	5x5	0	9x14	6x10	0	5x6	8x10	9x12	10x15	Fading.	
237..	24	0	4x4	3x4	3x4	3x8	0	3x3	5x5	6x7	7x8	20x21	500.
	48	0	0	0	0	8x8	0	7x9	8x8	8x9	10x12	0	
676..	24	0	0	0	4x5	0	0	0	0	0	0	15x15	No end point.
	48	0	0	0	0	0	0	0	0	0	0	0	
270..	24	0	3x5	0	8x11	10x11	0	6x6	5x4	10x14	10x15	25x25	No end point.
	48	0	9x11	15x19	15x20	15x25	0	9x14	15x19	17x19	15x21	Fading.	
663..	24	10x11	10x11	8x10	10x11	8x11	8x12	11x15	10x15	12x15	10x14	15x22	Serum sensitive.
	48	0	3x4	7x8	8x12	9x7	0	0	7x8	9x11	8x9	15x25	

[1] Standard serum containing 40 units per c. c.
[2] Serum control.
[3] Toxin control.

0=No reaction.
NOTE.—Measurements of two diameters of each reaction are recorded in millimeters.

The fraction of a cubic centimeter of serum is stated in each instance. Reactions less than 1 centimeter in diameter are considered negative. Neutralization is considered complete only when reactions to toxin-antitoxin mixtures are negative at both the 24 and 48 hour readings.

Protocol III illustrates the titration of a new lot of antitoxin by a manufacturer, while Protocol IV gives the results of tests made at the Hygienic Laboratory on the same lot.

PROTOCOL III

Manufacturer's protocol giving the results of his tests to determine potency of a new lot of antitoxin

Case	Hour of reading	Manufacturer's antitoxin Lot 50: 1/5,000 c. c	Manufacturer's antitoxin Lot 50: 1/5,000 c. c. plus one test dose of toxin	Manufacturer's antitoxin Lot 50: 1/6,000 c. c. plus one test dose of toxin	Hygienic Laboratory standard serum Lot C: 1/400 c. c.	Hygienic Laboratory standard serum Lot C: 1/400 c. c. plus one test dose of toxin	Hygienic Laboratory standard serum Lot C: 1/600 c. c. plus one test dose of toxin	Hygienic Laboratory standard serum Lot C: 1/800 c. c. plus one test dose of toxin	Hygienic Laboratory control toxin, one skin test dose	Number of units per c. c. of antitoxin Lot 50
R. J.....	24	0	0	0	0	0	9 x 7	9 x 9	15 x 15	500
	48	0	8 x 8	10 x 13	0	0	9 x 15	12 x 9	15 x 15	
M. V....	24	0	0	6 x 6	0	0	8 x 9	7 x 10	19 x 20	500
	48	0	0	9 x 14	0	0	7 x 10	10 x 11	15 x 18	
K. A....	24	0	0	17 x 17	0	0	10 x 9	10 x 10	25 x 25	500
	48	0	0	22 x 23	0	0	10 x 10	12 x 11	25 x 25	

NOTE.—See footnotes with Protocol II.

PROTOCOL IV

Results of tests made at the Hygienic Laboratory on same lot of manufacturer's antitoxin shown in Protocol III

Case	Hour of reading	Antitoxin Lot 50				Hygienic Laboratory standard serum Lot C					Hygienic Laboratory control toxin, one skin test dose	Number of units per c.c. of antitoxin, Lot 50
		1/5000 c.c.	1/5000 c.c. plus one test dose of toxin	1/6250 c.c. plus one test dose of toxin	1/7800 c.c. plus one test dose of toxin	1/400 c.c.	1/400 c.c. plus one test dose of toxin	1/500 c.c. plus one test dose of toxin	1/625 c.c. plus one test dose of toxin	1/780 c.c. plus one test dose of toxin		
674	24	0	5x5	5x5	8x10	0	0	0	4x4	6x6	16x17	500.
	48	0	6x8	13x14	18x28	0	0	10x15	10x18	13x15	0	
505	24	0	0	0	0	0	0	0	0	0	17x25	500.
	48	0	0	10x10	11x14	0	7x9	9x13	9x11	14x12	0	
324	24	0	5x6	9x9	8x9	0	3x3	3x6	5x5	7x9	20x25	500.
	48	0	8x8	11x20	15x27	0	5x6	8x10	9x12	10x15	Fading	
332	24	0	4x4	5x4	14x13	0	0	0	4x5	3x5	30x25	No end point.
	48	0	18x22	25x25	25x30	0	20x18	20x20	15x20	20x20	0	
745	24	30x30	30x30	30x35	30x30	25x25	30x30	30x30	30x30	25x25	20x30	Serum sensitive.
	48	Serum reactions approximately the same size as at 24-hour reading									0	

NOTE.—See footnotes with Protocol II.

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CURRENT WORLD PREVALENCE OF COMMUNICABLE DISEASES [1]

United States, May 6–June 2, 1928

The mortality rate from all causes in 67 large cities in the United States dropped off rapidly after the second week in May from the high level which had prevailed since the middle of March. Nevertheless, the general death rate in these cities remained relatively high; for the week ended June 2 it was 13.3 per 1,000 population (annual basis), as against 11.8 in the corresponding week of 1927 and 12.3 in the corresponding week of 1926. Although the death rate at no time rose sharply to an epidemic height, the maximum rate for a single week being 15.5 in the week ended May 5, the mortality rate averaged approximately 15 per 1,000 for a period of 8 weeks, and the death rate in these cities from January 1 to June 2 has been 14.3 as against 13.5 in the corresponding period of 1927. The rate is more favorable to date for the year, however, than it was in 1926, when there was a marked respiratory epidemic, and is about the same as it was in 1925.

Influenza and pneumonia.—The mortality from influenza and pneumonia in the principal cities also remained on a relatively high level as compared with the preceding year, but in the week ended May 19 the deaths from these causes turned downward. The death rate from influenza and pneumonia combined in the week ended May 19 was higher, on the average, than last year in the cities in all sections of the country except in the South Atlantic, West South Central, and Pacific divisions.

The number of cases of influenza reported by 31 States declined sharply, however, during the month of May. The maximum was reported for the week ended May 5, with 4,185 cases, and the weekly incidence dropped to 1,212 for the week ended June 2. The reported incidence in the early winter showed only a normal seasonal increase and compared very favorably with the same period of 1927; but in 1927 the maximum incidence was passed in the early part of March, when 2,532 cases were reported for the week ended March 10, whereas in the current year the most marked increase in cases occurred unusually late. This may have some relation to the fact that no real epidemic prevalence, such as occurred in February and March, 1926, took place, although cases of the disease were numerous throughout April. The decline in cases during May was noted in practically all States.

Meningococcus meningitis.—A decrease in the reported incidence of meningococcus meningitis occurred in the week ended June 2, when 101 cases were reported by 42 States, which is the smallest number reported by these States since the week ended March 3. During the four weeks ended June 2, these 42 States reported 493 cases, of

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[1] From the Office of Statistical Investigations, United States Public Health Service.

which 359 were in the following eight States: California, Illinois, Michigan, Missouri, New Jersey, New York, Pennsylvania, and Wisconsin. Of these eight States, only New York showed a decline from the total cases reported in the preceding four-week period, and Michigan, Missouri, New Jersey, and Wisconsin reported an increased number.

Smallpox.—The incidence of smallpox continued to decline during the month of May, the total number of cases reported by 42 States during the four-week period ended June 2 being 3,519, as compared with 3,900 for the preceding four-week period. The decline has been general, with no very marked change in the number of cases in any State. A slight increase in the number of cases was reported in Alabama, where the cases for the two weeks ended June 2 numbered 58, as compared with 15 in the preceding two weeks.

Scarlet fever.—The number of cases of scarlet fever reported weekly by 42 States and the District of Columbia has declined steadily though slowly since March. In the week ended June 2, the total number reported was 2,762 cases, as compared with 4,022 in the week ended May 5. The decline may be expected to continue throughout the summer, as the lowest incidence is usually reached at the end of August. The total reported incidence has been somewhat less in the current year than in 1927, but about equal to that in 1926. The case incidence reported in cities, however, indicates that the disease has been more prevalent than a year ago in the South Atlantic, East South Central, and West South Central divisions of the country, but much less prevalent in all other sections.

Diphtheria.—A gradual decline in the incidence of diphtheria continued through May and there were about 900 cases reported by 42 States for the week ended June 2, approximately 200 less than the weekly totals in the first half of May. During the four-week period ended June 2, 3,951 cases were reported, which was 1,000 less than the number reported for the same period in 1927, but only slightly less than in 1926. Throughout April and May the number of cases reported by the individual States showed very little change. In May a slight increase occurred in California, New Jersey, and Michigan, but the general trend in nearly all States was downward.

Typhoid fever.—The number of cases of typhoid fever reported weekly by 42 States began to increase during the month of May. For the four-week period ended June 2, there were 873 cases reported, as compared with 687 cases for the preceding four-week period. A slight increase occurred in several of the States. In Alabama the number of cases increased from 17 in the four-week period ended May 5 to 36 in the four-week period ended June 2; in California the number increased from 20 to 62; in Georgia from 13 to 53; in Tennessee from 16 to 39; in Wisconsin from 11 to 126. The increase in typhoid fever cases is normal for this season of the year, and the incidence is considerably lower than that of last year and slightly less than in 1926.

Poliomyelitis.—The number of cases of poliomyelitis increased during May; 102 cases were reported by 43 States during the four weeks ended June 5, as compared with 81 the preceding four weeks. In California the number of cases declined from 23 to 18, but in New York the number increased from 4 to 13; in Massachusetts, cases increased from 3 to 7; and in Pennsylvania 5 cases were reported in the earlier four weeks and 6 cases in the later. No other States reported more than five cases in either period.

Measles.—The expected seasonal decline in the incidence of measles began during May, as is evident from the reports of 38 States, which showed a total of 32,000 cases for the two weeks ended June 2, as compared with 36,500 cases for the two-week period ended May 5. In general, measles has maintained a higher level throughout the present year than in 1927, but is lower than in 1926. Among the States showing a significant decrease in the number of cases of measles reported are Arkansas, Georgia, Indiana, Louisiana, Maryland, Massachusetts, North Carolina, and Tennessee. On the other hand, several of the States reported a slight increase in the number of cases for the same period. In New York the number of cases reported increased from 7,012 in the two weeks ended May 5 to 8,157 in the two weeks ended June 2, and in Pennsylvania, from 4,689 to 5,548. The decrease should become more general during June, as the incidence reaches its lowest point in midsummer.

Foreign Countries[1]

The general prevalence for certain epidemic diseases in most foreign countries during March and April is summarized below.

Plague.—The plague outbreak at Aden decreased rapidly in April; 314 cases were reported in the two weeks ending April 7, 167 cases were reported in the next two weeks, and only 66 cases in the two weeks ending May 5. The reported fatality of cases has averaged about 75 per cent, and the deaths since the beginning of the year give a death rate of no less than 20 per 1,000 population. The population of Aden is about 55,000.

At Baghdad sporadic cases continued to occur, but only 18 cases had been reported from January 1 to May 12, 1928.

In India, plague was very much more in evidence in the United Provinces in March than elsewhere. During the four weeks ended March 24 14,875 deaths were attributed to plague in that Province, being 73.5 per cent of all India's plague mortality during those weeks. There were two main centers—an eastern one, including the districts of Azamgarh, Ghazipur, Gorakhpur, Bastia, and Fyzabad, and a northwestern one, in which the districts of Muzaffarnagar, Moradabad, Badaun, Bareilly, Pilibhit, Shahjahanpur, and Hardoi reported the largest number of cases.

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[1] Data from the Monthly Epidemiological Report of the Health Section of the League of Nations' Secretariat, May 15, 1928, supplemented by information published in the PUBLIC HEALTH REPORTS.

The maximum plague mortality in the eastern center of the United Provinces is normally reached in March, so no further considerable increase is likely to occur. In the western center, however, the peak of the curve is not likely to be reached before the middle of April. The present outbreak, in so far as the United Provinces is concerned, is likely to reach the same intensity as that of 1923; it is considerably more severe than those which occurred between 1924 and 1927.

The plague situation remains very favorable in the Punjab, only Ambala and neighboring districts in the northern part of the Province being affected by the disease.

At Hong Kong, one case of plague was reported on May 4, the first since September, 1923.

At Suez, 8 cases of plague occurred during April, and 42 cases had been reported since the beginning of the year. One case of plague was reported from Algiers on May 2, the only case to occur in the current year. No cases were reported in April in Mediterranean countries.

The number of plague cases reported in Senegal increased as usual in April, and during the first 20 days of that month 51 cases were reported in the district of Tivaouane and 30 cases in that of Thies. No plague case has been reported at Dakar since November. There were 12 plague cases at Lagos during the four weeks ended April 28, but none elsewhere in Nigeria; no case has been reported at Ijebu since February 11.

Plague was reported in several localities in Brazil during the early months of the year. In January there was a small outbreak at Parnahyba in the State of Sao Paulo; in March there were 2 cases at Porto Alegre. Thirty cases were reported at Bahia and 12 at Rio de Janeiro during the first quarter of the year. The Federal Health Service stated on April 19 that the last cases in those towns occurred 20 and 30 days previously, respectively.

In the Argentine, sporadic plague cases have been reported since the beginning of the year at Rosario, Buenos Aires, and at various inland localities in the Provinces of Cordoba, Santa Fe, and Santiago, which comprise the great plains west of the Parana River.

In Peru, 71 plague cases were reported in January and 41 in February, which is more than were reported last year but less than were reported in earlier years; 8 of these cases occurred in the town of Lima. Only 10 cases were reported at Guayaquil during the two first months of the year, as compared with 52 and 56 cases during the corresponding periods of 1926 and 1927, respectively.

Plague was reported in March about 60 miles from Caracas, in the State of Miranda in Venezuela.

Cholera.—The number of cholera cases reported in India increased from 9,293 during the three weeks ended March 3 to 14,144 in the following three weeks. This is the season, however, when such an increase usually occurs. A large majority of the cases (81 per cent) occurred in Bengal and the adjoining districts of Bihar and Orissa; the increase was confined to this area, whereas the incidence has decreased in Madras Presidency since the beginning of February.

In Siam, 768 cholera cases were reported during the first quarter of 1928, which is slightly more than the number reported during the corresponding period of the preceding year. There has been no increase of the incidence since early in February.

Cholera cases have increased steadily during the current year in Cochin-China, where 593 cases were reported in the first 20 days of April as against 462 in the preceding 20 days. In Cambodia, the number of cases began to increase at the end of March, and 145 cases were reported in the first 20 days of April, as compared with 55 cases in the first 20 days of March. The disease is more prevalent than it was last year in Cochin-China, but less prevalent in Cambodia. Very few cases have been reported in other parts of Indo-China.

Influenza.—No epidemics of influenza occurred during the first four months of the year anywhere in Europe, and the past winter can be described as one of the most favorable influenza years since 1918. In English towns, the mortality from influenza during the first four months was equally low only in 1921 and 1923.

There was a small increase of influenza deaths at the end of March in English, Dutch, and German towns, but the incidence soon decreased again. In Vienna, where influenza was little in evidence during the preceding winter, it caused 50 deaths in March, as compared with 6 in February.

In the Netherlands, the number of deaths attributed to influenza increased from 122 in February to 419 in March, giving a total of 688 deaths during the first quarter of 1928, as compared with 2,824 and 432 deaths during the corresponding period of 1927 and 1926, respectively. In March, 73 deaths occurred at Rotterdam, 32 at The Hague, and 22 at Amsterdam.

In the Union of Soviet Socialist Republics, influenza was more prevalent in January, the latest month for which figures are available, than in the corresponding month a year ago. Moscow town and Government reported 63,481 cases and Leningrad town and Government 10,931 cases, as compared with 16,486 and 2,163 cases, respectively, in January, 1927. During the same month, there were only 63 deaths from influenza in Leningrad and 46 in Moscow, which shows that the disease was of a benign type. The increase over last year seems to have extended over the whole country, but to have been least marked in Siberia.

Influenza was reported to be epidemic and causing a considerable mortality in December, 1927, in the Province of Chihli in Northern China; in November it had been epidemic in Shantung and Kiangsu, the two Provinces south of Chihli. Influenza was epidemic in December also in Yunnan, but was of a mild type, causing no appreciable mortality.

There was a slight increase of deaths attributed to influenza in towns in Japan in March, the number being 450 during the four weeks ended March 31, as compared with 228 during the preceding four weeks.

CURRENT STATE MORTALITY STATISTICS

For the information of public health officials and others interested, the data in the following tables have been compiled from the monthly mortality reports of State health departments for the latest month for which published records are available. Statistics of most communicable diseases are not included, since they are available in other tabulations in the Public Health Reports. Statistics of deaths from other causes are limited for the most part to those causes which appear in the State reports. In the case of States which publish detailed mortality reports each month, the record of only the principal groups of causes and certain important specific causes have been used.

For purposes of comparison, the mortality records for a few preceding years are given, the rates being for the month corresponding to the last month for which the 1928 rate is available.

These tabulations will be enlarged as the current data on mortality from additional States become available.

Monthly State mortality statistics

(All rates are per 100,000, except mortality from all causes and infant mortality)

	1928			Corresponding month for—			
	Jan.	Feb.	Mar.	1927	1926	1925	1924
ALL CAUSES: ANNUAL RATE PER 1,000							
Alabama:							
White	10.4	10 1	10 7	8.4	12.4		
Colored	14 6	17.3	17.7	13.6	20.5		
Connecticut	11.7	.12 0	12.0	11 6	15.3	13.1	13.7
Indiana	12.4	11.7	13.6	11.9	15.9	14.4	13.6
Iowa			12.1				
Kansas	10 9						
Minnesota	9 5	9.6	9 6				
New Jersey	11 3	12.4	13.3	12 8	11.8	12.6	13.2
New York	13 6	14.2	14.4	13 7	19.8	16.2	15.8
Oklahoma	10.5						
Pennsylvania	12.4	13.3	13.8	13.4	17.5	14.5	15.1
Tennessee	11.8	12.9	12 3	11.9			

Monthly State mortality statistics—Continued

(All rates are per 100,000, except mortality from all causes and infant mortality)

INFANT MORTALITY: RATE PER 1,000 LIVE BIRTHS

	1928			Corresponding month for—			
	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	80.3	78.4	77.6	56.2	70.2		
Colored	126.2	118.0	108.5	76.1	108.0		
Connecticut	68.4	55.7	65.7	68.6	89.2	85.6	89.2
Indiana	68.7	59.8	67.9	60.7	77.5	76.4	67.6
Iowa			66.4				
Kansas	70.0						
New York	68.0	72.0	73.0	69.0	95.0	82.0	84.0
Oklahoma	86.2						
Pennsylvania	70.6	81.0	83.0	82.0	109.0	94.0	

INFLUENZA (11)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	89.1	83.9	98.8	48.1	239.5		
Colored	86.0	112.8	124.0	56.6	348.3		
Connecticut	28.5	25.8	19.7	37.1	110.3	57.0	26.6
Indiana	48.1	44.0	69.3	39.6	167.0	138.1	43.8
Iowa			79.5				
Kansas	53.3						
Minnesota	21.2	22.7	29.8				
New Jersey	12.6	16.1	24.7	25.1	87.3	19.3	21.4
New York	20.0	20.7	25.3	24.9	128.7	29.1	18.3
North Carolina			63.7				
Oklahoma	21.8						
Pennsylvania	37.3	38.2	51.3	46.7	143.0	65.7	72.0
South Carolina	49.9	81.7	132.6	28.7			
Tennessee	77.2	89.5	88.5	68.2			

TUBERCULOSIS, ALL FORMS (31-37)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	58.1	53.9	57.5	41.5	68.7		
Colored	136.9	179.1	162.2	163.2	182.7		
Connecticut	63.5	75.1	83.9	75.7	95.9	87.0	82.3
Indiana	67.8	67.4	88.2	82.2	100.6	95.1	97.9
Iowa			38.8				
Kansas	29.5						
Minnesota	51.5	64.7	60.1				
New Jersey	65.0	70.8	78.9	92.3	101.1	96.5	86.3
New York	66.5	82.1	82.5	85.0	109.3	103.5	106.6
North Carolina			86.6				
Oklahoma	59.7						
Pennsylvania	64.7	78.5	78.4	87.0	96.7	92.4	90.6
South Carolina	72.6	74.9	87.2	102.1			
Tennessee	121.9	150.9	140.7	138.8			

CANCER, ALL FORMS (43-49)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	46.8	36.0	44.9	50.3	49.5		
Colored	41.2	39.5	48.8	42.1	36.8		
Connecticut	113.8	106.6	105.8	113.6	102.0	107.0	98.0
Indiana	99.3	87.6	117.1	96.4	95.0	94.3	84.5
Iowa			121.2				
Kansas	95.6						
Minnesota	112.0	94.8	115.1				
New Jersey	99.2	102.4	107.9	107.1	105.3	99.4	95.9
New York	127.5	121.2	128.6	117.6	125.7	132.6	129.7
Oklahoma	58.7						
Pennsylvania	95.5	102.0	95.4	101.0	104.0	90.4	97.5
South Carolina	30.3	39.2	51.2	36.4			
Tennessee	58.8	51.3	53.2	63.5			

Monthly State mortality statistics—Continued

(All rates are per 100,000, except mortality from all causes and infant mortality)

DIABETES (57)

	1928			Corresponding month for—			
	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	12.8	6.0	9.8	9.5	8.9		
Colored	14.5	14.1	18.5	5.3	7.9		
Iowa			19.9				
Kansas	24.4						
Minnesota	19.0	19.4	24.7				
New York	27.6	27.2	27.4	26.4	34.7	25.2	26.2
Oklahoma	12.6						
Pennsylvania	21.7	23.5	27.8	20.6	23.8	20.0	14.4
South Carolina	12.6	13.6	11.4	11.5			

DISEASES OF THE NERVOUS SYSTEM AND OF THE ORGANS OF SPECIAL SENSE (70-86)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Iowa			153.2				
Kansas	146.9						
New Jersey	112.5	120.9	126.3	142.3	173.1	139.3	141.7
New York	159.1	169.8	176.1	167.5	212.8	203.0	196.7
Oklahoma	114.5						

CEREBRAL HEMORRHAGE, APOPLEXY (74)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	42.3	47.2	57.5	51.0	51.7		
Colored	58.1	84.6	87.1	78.9	55.2		
Indiana	121.5	122.5	(1)	107.6	121.0	109.5	
Iowa			111.5				
Kansas	114.2						
New York	121.0	131.8	134.7	121.5	166.3	154.4	146.9
Oklahoma	63.6						
Pennsylvania	100.0	101.0	97.2	(1)	(1)	(1)	(1)

DISEASES OF THE CIRCULATORY SYSTEM (87-96)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Iowa			310.8				
Kansas	213.7						
New Jersey	272.7	272.4	281.6	272.6	350.7	231.9	265.8
New York	375.0	399.7	369.1	356.3	496.3	383.8	366.8
Oklahoma	90.8						
South Carolina	220.5	278.2	277.9	277.0			

DISEASES OF THE HEART (87-90)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	114.7	116.9	96.0	80.9	102.7		
Colored	124.8	150.9	189.9	126.3	142.0		
Connecticut	168.5	200.3	198.4	194.5	250.7	188.6	
Indiana	[2] 198.5	[2] 158.1	[2] 188.0	[2] 168.2	[2] 207.3	[2] 167.4	
Iowa			279.8				
Kansas	181.6						
Minnesota	156.2	165.5	160.9				
New York	328.3	345.5	323.7	308.5	433.9		
Oklahoma	82.0						
Pennsylvania	246.0	256.0	272.0	251.0	301.0	198.0	
Tennessee	105.9	137.3	101.9				

[1] Not available.
[2] Reported as organic heart.

Monthly State mortality statistics—Continued

(All rates are per 100,000, except mortality from all causes and infant mortality)

PNEUMONIA, ALL FORMS (100, 101)

	1928			Corresponding month for—			
	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	167.6	144.6	162.6	81.6	164.8		
Colored	191.4	200.2	203.1	118.4	286.6		
Connecticut	140.8	148.6	151.7	125.4	227.3	180.9	207.7
Indiana	137.0	120.1	151.3	107.6	217.1	191.0	178.2
Iowa			98.4				
Kansas	105.9						
Minnesota	80.5	77.7	87.4				
New Jersey	80.4	108.7	111.2	86.1	220.1	101.1	104.0
New York	120.4	131.3	152.8	126.0	296.2	169.5	151.2
North Carolina			168.7				
Oklahoma	198.0						
Pennsylvania	131.0	154.0	191.5	161.0	295.0	209.0	271.0
South Carolina	178.1	155.3	161.7	157.6			
Tennessee	163.8	163.0	162.8	129.8			

DISEASES OF THE DIGESTIVE SYSTEM (108-127)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Iowa			65.5				
Kansas	62.9						
New Jersey	[1] 47.5	[1] 58.0	[1] 60.4	[1] 62.5	[1] 62.4	[1] 59.2	[1] 67.9
New York	69.0	86.2	79.8	68.3	80.5	89.0	96.4
Oklahoma	62.1						

DIARRHEA AND ENTERITIS UNDER 2 YEARS (113)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	11.3	6.0	5.6	7.3	6.7		
Colored	4.8	9.9	9.2	7.9	9.2		
Connecticut	9.5	4.8	3.6	7.4	10.6	9.2	14.1
Indiana	7.0	10.7	9.3	9.3	9.0	11.0	12.7
Iowa			5.8				
Kansas	7.7						
Minnesota	[2] 10.4	[2] 8.8	[2] 10.8				
New Jersey	[3] 9.6	[3] 10.5	[3] 10.2	[3] 11.3	[3] 14.1	[3] 17.0	[3] 16.0
New York	10.9	11.5	10.3	7.9	15.1	21.8	19.9
North Carolina			10.0				
Oklahoma	11.2						
Pennsylvania	16.7	19.0	16.1	17.0	19.7	24.0	22.6
South Carolina	[4] 3.8	[4] 8.8	[4] 8.2	[4] 10.8			
Tennessee	4.7	3.5	4.7	6.6			

NEPHRITIS (128, 129)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	[5] 74.7	[5] 66.7	[5] 75.7	[5] 59.8	[5] 73.9		
Colored	[5] 92.1	[5] 90.2	[5] 91.0	[5] 101.3	[5] 97.3		
Connecticut			71.5				
Indiana	[6] 70.4	[6] 86.8	[6] 85.6	[6] 93.4	[6] 94.2	[6] 91.3	
Iowa			53.8				
Kansas	85.3						
Minnesota	[7] 66.2	[7] 62.4	[7] 54.5				
New Jersey	[8] 108.5	[8] 118.6	[8] 124.8	[8] 107.7	[8] 125.7	[8] 109.9	[8] 118.7
New York	121.8	117.6	120.0	120.2	147.8	138.7	126.8
Oklahoma	64.1						
Pennsylvania	117.0	122.0	115.0	114.0	141.0	118.0	128.0
South Carolina	[8] 83.4	[8] 99.9	[8] 108.6	[8] 93.2			

[1] Infantile diarrhea excepted.
[2] Reported as diarrhea of children.
[3] Reported as infantile diarrhea.
[4] Reported as intestinal diseases of children under 1 year.
[5] Reported as chronic nephritis.
[6] Reported as Bright's disease.
[7] Reported as nephritis.
[8] Reported as kidney diseases.

Monthly State mortality statistics—Continued

(All rates are per 100,000, except mortality from all causes and infant mortality)

PUERPERAL STATE (143-150)

	1928			Corresponding month for—			
	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White		[5] 21.0	[5] 20.3	[5] 14.6	[5] 19.2		
Colored		[5] 16.9	[5] 25.1	[5] 23.7	[5] 39.4		
Connecticut	[6] 9.5	[6] 8.9	[6] 13.1	[6] 8.2	[6] 21.9	[6] 9.2	[6] 10.2
Indiana	[7] 11.9	[7] 8.7	[7] 11.5	[7] 14.2	[7] 17.0	[7] 14.5	[7] 6.5
Iowa			11.2				
Kansas	7.1						
Minnesota	[5] 9.5	[5] 10.2	[5] 14 3				
New York	10 9	13.3	12 0	13 1	13.3	14.0	14.0
Oklahoma	11.6						
Pennsylvania	[8] 5.3	[8] 5.3	[8] 6.6	[8] 6.9	[8] 7.9	[8] 7.2	
Tennessee	[7] 6.1	[7] 4.5	[7] 7.1	[7] 7.6			

CONGENITAL MALFORMATION AND DISEASES OF EARLY INFANCY (159-163)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	67.2	70 4	69 4	83.1	84.3		
Colored	69.0	98 7	92.3	73.7	74.9		
Iowa			61.1				
Kansas	53 9						
New York	65.2	70.2	69.4	70.3	84.2	86.9	90.1
Oklahoma	86.0						
Pennsylvania	[1] 34.9	[1] 37.6	[1] 35.1	[1] 37 6	[1] 42 2	[1] 39 0	

AUTOMOBILE ACCIDENTS (188c)

	Jan.	Feb.	Mar.	1927	1926	1925	1924
Alabama:							
White	14.3	14.2	15.4	8 0	10.3		
Colored	10.9	7.0	13 2	13.2	9.0		
Iowa			12.1				
Kansas	10 9						
Minnesota	8 7	8.3	2.2				
New Jersey	12 9	17 1	28.0	18 8	16.3		
New York	17.0	15 3	15.4	14.1	11.1	13.8	14.1
North Carolina			8.8				
Oklahoma	8.7						
Pennsylvania	13 5	12.2	11.8	14 9	11 2	10.9	8.9
South Carolina	11.4	10 8	11 4	9.6			
Tennessee	13.2	10.6	9.4				

[1] Rate per 1,000 live births.
[5] Puerperal state
[6] Reported as puerperal diseases.
[7] Reported as puerperal septicemia.
[8] Rate per 1,000 total births.

COURT DECISION RELATING TO PUBLIC HEALTH

Issuance of permit for conduct and maintenance of stable.—(California First District Court of Appeal, Division 2; Ryan *v.* Andriano et al., 266 P. 831; decided April 19, 1928.) The plaintiff operated a stable under a permit issued in the name of the person from whom he had purchased the stable. On application to the board of supervisors of the city of San Francisco for permission to make additional improvements, it was noticed that the permit was not in the plaintiff's name, and he was instructed first to procure such a permit. Application for a permit was made, but protests against the granting of the same were received by the board, and finally, after two years,

the application was denied. During the pendency of the application the board did not specify objectionable features of the stable and did not fix a time within which the plaintiff was required to remove same. The stable ordinance of the city required a permit for the maintenance of a stable, and also contained the following provisions:

SEC. 4. The board of supervisors shall not refuse a permit for the maintenance of a stable in a building now constructed and maintained as a stable except upon satisfactory evidence that such stable is conducted in an insanitary manner and the failure to remove the objection to the manner of its maintenance within a time to be prescribed by the board of supervisors.

SEC. 6. No permit shall be refused or revoked by the board of supervisors except after a full hearing, and then only in the exercise of a sound and reasonable discretion by said board.

The plaintiff's stable was in operation when the said ordinance was passed. Upon the board's denial of his application, the plaintiff sought by mandamus to compel the granting of a permit. The appellate court reversed the lower court's judgment denying a writ of mandamus, and held that the plaintiff's application for a stable permit could not be denied without opportunity being first given him to remove objections to be specified by the board within a time to be also specified by the board, as provided in section 4 of the ordinance.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Tests with the Activated Sludge Method of Sewage Treatment at Waldenburg (Silesia). G. Jordan Gesundh. Ign. 51, 150-6 (1928). (Abstract by Wayne L. Denman in *Chemical Abstracts*, vol. 22, No. 9, May 10, 1928, p. 1641.)

"The purification plant used in this work consists essentially of a concrete basin which is alternately divided by baffles. Circulation of the sewage is accomplished by means of paddle wheels. The plant handles a mixture of domestic and industrial sewage. The industrial sewage amounts to about 8 per cent of the domestic sewage. Three series of tests were made to determine the normal and high rates of treatment. These rates were 2, 1.5, and 1.1 per second. At 1.1 per second a good sludge is obtained It is in large clumps and its volume is reduced to 25 per cent in 15 minutes. Its water content is 98.5 per cent. At 2 per second very poor results were obtained. The sludge was of a fine structure, and in 15 minutes its volume was 80-90 per cent, with a water content of 99 5 per cent. At a rate of 1.5 per second better results were obtained but were not up to those obtained at 1.1 per second. The effect of suspended matter such as finely powdered coal was tried and found to be very harmful, but the trouble vanishes as soon as the sewage clears. The addition of a substance such as $Al_2(SO_4)_3$ will overcome this difficulty. The action of phenol was noted, as the industrial sewage contained a small quantity from coke plants. It was found that phenol present in considerable amounts did little if any harm. The effluent was clear and had a slight earthy odor. Sewage consisting of 10 per cent phenol sewage (13 days at 457 p. p. m. phenol and 21 days at 191 p. p. m. phenol) may be satisfactorily treated by the activated sludge process. A very high bacterial removal is obtained. For a plant of this type exact and rigorous attention to details must be observed if the operation is to be successful."

Seeding New Tanks. Willem Rudolfs. Report of the Department of Sewage Disposal of the New Jersey Agriculture Experiment Station for year ending June 30, 1927, pp. 284–294. (Abstract by W. L. Havens.)

The difficulty sometimes experienced in starting the operation of a new tank was deemed of sufficient importance to warrant laboratory experiments in order to determine what could be substituted for ripe sludge when the latter was not available. Definite quantities of fresh solids were mixed with ripe sludge, horse manure, cow manure, and muck from a creek and results compared with fresh solids seeded with ripe Imhoff sludge. It was found that neither manure nor muck is as effective for seeding as ripe sludge. Muck was about half as good as ripe sludge and horse and cow manure still less. If sludge from a polluted stream is available for seeding, it is to be favored. Seeding with horse manure and additions of lime are beneficial, but still inferior to seeding with ripe sludge. Additions of lime to fresh solids when ripe sludge is present for seeding keeps floating solids down.

Sanitary Districts in Missouri. Anon. *The American City*, vol. 38, No. 4, April 1928, p. 125. (Abstract by J. B. Harrington.)

In March, 1927, the State law of Missouri was reframed to provide for the construction of sanitary sewers in all suburban districts of any county having a population of over 75,000 people. The procedure to be followed requires that a petition signed by 100 property owners must be submitted to the circuit court. The circuit judge, upon favorable decision, appoints three supervisors, who organize and appoint a secretary, an attorney, and an engineer, and levy a tax not to exceed 10 cents per 100 square feet of area for preliminary work.

Studies on the Decomposition of Cellulose. H. Heukelekian. Report of the Department of Sewage Disposal of the New Jersey Agricultural Experiment Station for year ending June 30, 1927, pp. 272–284. (Abstract by W. L. Havens.)

Experiments were carried on during the past year in an effort to study the fundamental processes of sludge digestion, not from the standpoint of changes in bacterial life, but as measured by the decomposition of organic material. Two methods were employed--first, following the changes in the cellulose content of digesting material, and, second, adding cellulosic substance to ripe sludge and following the changes induced. The following conclusions were reached as a result of these experiments: (1) The native cellulose of fresh solids as well as cellulose added to ripe sludge in the form of filter paper decomposes rapidly; (2) the decomposition of cellulose takes place in the early part of the digestion, namely, the first three weeks; (3) the decomposition of cellulose gives rise to acidity, which retards the general course of the digestion; (4) cellulose decomposition takes place under acid conditions, but the addition of lime accelerates the rate of decomposition; (5) the decomposition of cellulose is accompanied by the production of gas, the volume of which is much smaller than that produced in the decomposition of an equal amount of mixed organic matter in fresh solids; (6) there is a lag of 5 or 6 days before the decomposition of cellulose starts; (7) the rapidity of decomposition of cellulosic substances is correlated with their cellulose content; (8) cellulose content of the solids collected from the inlet end of an Imhoff tank is higher than that from the outlet end; (9) the digestion of the material from the inlet end was similar to the type of digestion obtained from the mixture of solids. The material from the outlet end had a shorter period of acid digestion, lower acidity, and a higher alkalinity and higher ash content than the material from the inlet end.

Design and Operation of Storm Tanks. C. Chamberlain. *The Canadian Engineer*, vol. 54, No. 1, January 3, 1928, pp. 101–103. (Abstract by R. E. Thompson.)

The storm water at the York Township plant flows into a small creek, and it was therefore considered necessary to provide for more than the usual "three times the dry weather flow." As this condition was expected to last for only a few years, two tanks, 77 feet square, with sloping bottoms and equipped with Dorr scrapers, were constructed which could be used without alteration for treatment of domestic sewage in the future. The material collected is of two types—(1) coarse material such as stones, cinders, and brick fragments; and (2) material varying from fine sand to mud, containing a certain amount of organic matter. The former material interfered with the operation of the diaphragm pump used for removing the sludge, and the plant has now been rearranged somewhat to provide an extra grit chamber for removal of this coarse material. The fine material is removed from the tanks with a Stereophagus pump and deposited in sand beds. After being dried, it is utilized for fill around the beds. The streets are unpaved and a great deal of material is carried into the sewers during storm periods. Following one storm of 2½ hours' duration, 175 cubic yards of material was removed from the tank and 10 cubic yards from the additional grit chambers.

Returned Sludge in Water Purification. A. W. Bull. *Water Works*, vol. 67, No. 3, March, 1928, p. 112. (Abstract by C. R. Cox.)

This is a summary of experiments made at Columbus and Pittsburgh to ascertain the effect of adding settled sludge to water dosed with lime and soda ash, such as is the practice at Benton Harbor, Mich., Piqua, Ohio, and Hinsdale and Springfield, Ill. Results indicate that the addition of sludge increases the speed of the softening reaction to a marked extent, although the hardness could not be reduced much below 100 p. p. m. by even larger amounts of added sludge. Thus, 19 hours' agitation of the treated water was necessary to produce the same softening reaction secured by 2 hours' agitation with the same chemical doses plus 50 c. c. of sludge per gallon, or by 1 hours' agitation with 100 c. c. of sludge. Best results were secured at Columbus with initial concentrations of 15,000 p. p. m. suspended solids, whereas at Pittsburgh 7,100 p. p. m. was the best initial concentration. The beneficial results "are due to either a catalytic speeding up of the reaction or, more probably, to a reduction in supersaturation." Settled sludge may be easily returned to raw water through the use of continuously cleaned sedimentation basins, such as the Dorr clarifier.

Reservoir Protection. Carl Wilson. *Water Works*, vol. 67, No. 2, February, 1928, p. 50. (Abstract by H. B. Hommon.)

Storage reservoirs: There are no communities on the tributary watersheds; and for control over pollution from landowners and other sources the city enforces the State laws regarding pollution of domestic waters. All reservoirs are fenced and patrolled, and hunting, fishing, boating, bathing, and picnicking are prohibited inside the fenced areas. Grazing is prohibited within half a mile of the reservoirs, and leaching cesspools and earth privies are not permitted closer than 250 feet.

Distribution reservoirs: These reservoirs are protected by (1) strong wire fencing that practically excludes the public; (2) resident patrolmen; (3) bypassing storm water and carrying domestic sewage outside the drainage basins; (4) prohibiting leaching cesspools and privy vaults on the land draining to the reservoirs; and (5) requiring that domestic animals, including chickens, be kept 100 feet away from the water.

Chlorination: All water is chlorinated as it leaves the distribution reservoirs. No other purification is considered necessary.

Abolition of Cross Connections Causes Lively Discussion. Anon. *Engineering News-Record*, vol. 100, No. 12, March 22, 1928, pp. 488–490. (Abstract by C. R. Cox.)

A special committee of the New England Water Works Association reported upon cross connections at the March 14, 1928, meeting. The report was in the nature of a compromise in which the details of the problems involved were discussed in a report of 45 pages, including 25 pages of appendices.

Subcommittee No. 1 on fire hazards recorded 12 cases where fires broke out simultaneously with the interruption of the public water supplies. This committee emphasizes the fact that the New York State labor law permits double the number of employees in buildings equipped with sprinkling systems supplied from two individual sources. The committee concluded that secondary supplies of sufficient capacity were impracticable in cost unless ponds or rivers were utilized and that cross connections should be used to combine the two supplies for common fire-protection systems.

Subcommittee No. 2 on health hazards cited 22 epidemics due to cross connections containing a single gate or check valve. The committee reviewed the position of the public health authorities by stating that, although it was necessary seriously to consider economical phases of fire losses, the saving of life rather than money must be the predominant consideration. This committee stated that the courts had placed responsibilities upon the municipalities for water-borne epidemics when such are due to a negligence in design, installation, operation, or inspections of cross connections. The responsibility also rests upon State authorities, although such responsibility is moral rather than legal.

The committee, therefore, compared the relative fire and health hazards by weighing the economic losses resulting from the 12 fires mentioned above in contrast to the intangible as well as economic losses of 8,028 cases of typhoid fever with 26 deaths and more than 1,000 cases of enteric disturbances occurring with losses by death and disability running into the millions of dollars. They therefore concluded that cross connections with single check valves were too hazardous and that even the best installations of double check valves may fail from lack of inspection. Statistics are given regarding the frequency that leaky valves were found during tests at New Bedford, Mass., and in Connecticut.

In general the committee feels that double check valves of the latest improved type, properly installed and adequately safeguarded, furnish the best protection of any device now known. It is hoped that recent installations of these valves will provide data upon the actual effectiveness of these devices. The committee feels that State regulations should be promulgated, but that our responsibility should rest upon the municipalities wherein cross connections are maintained. The report recommends cooperative inspection of double check valves by municipal and State authorities and by the owners and the insurance companies at quarterly intervals.

The final resolutions recommended by the committee were not adopted by the association, pending the printing of the full report in the June issue of the *Journal* of the association and a detailed study of the report by the members.

DEATHS DURING WEEK ENDED JUNE 16, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended June 16, 1928, and corresponding week of 1927. (From the Weekly Health Index, June 20, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended June 16, 1928	Corresponding week, 1927
Policies in force	65, 735, 862	62, 918, 546
Number of death claims	12, 187	11, 891
Death claims per 1,000 policies in force, annual rate	9. 7	9. 9

Deaths from all causes in certain large cities of the United States during the week ended June 16, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, June 20, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended June 16, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended June 16, 1928 [2]
	Total deaths	Death rate [1]		Week ended June 16, 1928	Corresponding week, 1927	
Total (69 cities)	7,160	12.2	11.6	721	736	58
Akron	46			9	8	98
Albany [3]	37	16.1	10.9	4	3	82
Atlanta	78	16.0	13.2	11	11	
White	38		9.2	6	7	
Colored	40	(4)	22.6	5	4	
Baltimore [3]	185	11.6	12.2	10	22	32
White	139		10.1	6	13	24
Colored	46	(4)	24.7	4	9	63
Birmingham	75	17.6	14.9	10	8	86
White	41		11.0	4	4	55
Colored	34	(4)	20.9	6	4	135
Boston	199	13.0	14.1	25	36	69
Bridgeport	28			2	1	37
Buffalo	138	13.0	12.5	17	17	73
Cambridge	23	9.6	8.8	2	1	36
Camden	29	11.2	12.1	3	1	48
Canton	23	10.3	11.5	4	4	95
Chicago [3]	760	12.6	11.3	69	77	59
Cincinnati	136	17.2	14.0	9	8	54
Cleveland	180	9.3	10.1	17	13	46
Columbus	87	15.3	12.0	6	3	56
Dallas	42	10.1	9.6	5	8	
White	31		8.8	5	6	
Colored	11	(4)	15.2	0	2	
Denver	78	13.9	15.5	8	7	
Des Moines	28	9.6	11.9	4	7	66
Detroit	330	12.5	10.7	44	51	68
Duluth	17	7.6	8.6	1	1	23
El Paso	27	12.0	14.7	8	3	
Erie	17			1	2	21
Fall River [3]	25	9.7	10.2	1	2	17
Flint	25	8.8	9.9	4	6	51
Fort Worth	40	12.4	10.2	4	5	
White	33		9.1	3	3	
Colored	7	(4)	18.6	1	2	
Grand Rapids	21	6.7	10.0	2	1	30
Houston	80			13	3	
White	51			9	2	
Colored	29	(4)		4	1	
Indianapolis	103	14.1	12.0	8	4	61
White	83		9.8	7	1	61
Colored	20	(4)	27.9	1	3	61
Jersey City	63	10.1	11.4	8	8	60
Kansas City, Kans.	19	8.4	15.1	0	4	0
White	14		15.7	0	3	0
Colored	5	(4)	12.3	0	1	0
Kansas City, Mo.	119	15.9	10.8	16	6	113
Knoxville	13	6.4	11.2	1	3	22
White	7		9.9	1	3	24
Colored	6	(4)	21.4	0	0	0
Los Angeles	228			24	21	69
Louisville	81	12.9	9.6	6	1	50
White	62		7.5	1	1	10
Colored	19	(4)	21.3	5	0	344
Lowell	23	10.9	13.7	2	4	42
Lynn	27	13.4	5.5	3	1	76
Memphis	66	18.1	18.9	8	9	94
White	34		15.3	3	4	56
Colored	32	(4)	25.5	5	5	157
Milwaukee	110	10.6	8.6	18	12	80
Minneapolis	70	8.0	11.2	8	9	48
Nashville	60	22.6	16.6	9	4	142
White	36		13.7	9	2	192
Colored	24	(4)	24.1	0	2	0

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, June 15, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended June 16, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, June 20, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended June 16, 1928: Total deaths	Week ended June 16, 1928: Death rate	Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year: Week ended June 16, 1928	Deaths under 1 year: Corresponding week, 1927	Infant mortality rate, week ended June 16, 1928
New Bedford	30	13.1	6.1	5	2	108
New Haven	38	10.6	9.6	5	2	71
New Orleans	122	14.9	18.6	10	30	48
White	65		14.4	1	15	7
Colored	57	(4)	30.3	9	15	131
New York	1,420	12.3	11.4	144	146	58
Bronx Borough	183	10.1	8.8	9	13	27
Brooklyn Borough	464	10.5	10.0	54	60	54
Manhattan Borough	614	18.3	15.1	69	56	82
Queens Borough	120	7.3	9.0	11	13	44
Richmond Borough	39	13.5	16.0	1	4	18
Newark, N. J.	109	12.0	12.4	8	15	41
Oakland	52	9.0	9.0	2	5	22
Oklahoma City	22			3	2	
Omaha	51	12.0	13.1	5	6	58
Paterson	40	14.4	12.3	3	6	52
Philadelphia	455	11.5	11.4	48	41	65
Pittsburgh	166	12.9	12.8	16	17	52
Portland, Oreg.	52			4	2	43
Providence	78	14.2	8.9	11	4	98
Richmond	53	14.3	13.3	9	3	118
White	34		9.6	3	1	61
Colored	19	(4)	22.5	6	2	220
Rochester	75	11.9	11.1	6	12	49
St. Louis	192	11.8	12.2	8	16	27
St. Paul	60	12.4	8.1	4	2	38
Salt Lake City [3]	37	14.0	10.8	4	1	65
San Antonio	65	15.6	11.3	15	4	
San Diego	50	21.8	13.1	4	5	76
San Francisco	156	13.9	13.6	7	8	44
Schenectady	14	7.8	8.4	4	1	125
Seattle	67	9.1	8.8	4	9	41
Somerville	17	8.7	6.2	2	0	60
Spokane	29	13.9	14.4	3	1	77
Springfield, Mass.	25	8.7	9.9	1	4	16
Syracuse	53	13.9	13.5	6	6	73
Tacoma	23	10.9	11.2	0	1	0
Toledo	50	8.3	11.1	4	3	38
Trenton	40	15.0	14.5	5	3	85
Utica	34	17.1	15.1	0	3	0
Washington, D. C.	116	11.0	12.2	10	7	57
White	66		9.6	4	0	33
Colored	50	(4)	19.9	6	7	111
Waterbury	21			3	2	87
Wilmington, Del.	17	6.9	7.4	2	0	53
Worcester	41	10.8	13.9	6	6	73
Yonkers	22	9.5	9.2	3	3	68
Youngstown	26	7.8	6.5	2	4	27

[3] Deaths for week ended Friday, June 15, 1928.

[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

No health department, State or local can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 23, 1928, and June 25, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 23, 1928, and June 25, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 23, 1928	Week ended June 25, 1927	Week ended June 23, 1928	Week ended June 25, 1927	Week ended June 23, 1928	Week ended June 25, 1927	Week ended June 23, 1928	Week ended June 25, 1927
New England States:								
Maine	3	2	31	3	51	55	0	0
New Hampshire					45		0	
Vermont		2			34	39	0	0
Massachusetts	51	84	7	9	614	351	3	0
Rhode Island	9	15			195	2	0	0
Connecticut	15	34	2		293	68	1	0
Middle Atlantic States:								
New York	299	487	[1] 18	[1] 9	2,509	805	17	6
New Jersey	148	91	18	3	989	38	4	3
Pennsylvania	114	149			2,280	449	9	2
East North Central States:								
Ohio	27		23		700		2	
Indiana	20	22	5	2	230	68	0	0
Illinois	140	112	21	6	186	416	3	8
Michigan	108	88	3	1	770	106	7	2
Wisconsin	18	32	56	25	64	710	1	4
West North Central States:								
Minnesota	44	12		2	32	62	1	2
Iowa	3						1	
Missouri	27	22	4		197	67	6	0
North Dakota	1	2	2		8	30	0	0
South Dakota		1			6	6	0	0
Nebraska	3	12			28	60	0	0
Kansas	9	14	1	2	50	257	0	1
South Atlantic States:								
Delaware		2			18	6	0	0
Maryland [2]	31	52	5		207	14	0	0
District of Columbia	7	6	1		130	8	0	0
Virginia								
West Virginia	5	17	42	8	39	145	0	0
North Carolina	12	5			235	759	0	1
South Carolina	7	6	231	150	75	209	0	0
Georgia	3	10	23	13		27	0	1
Florida	2	7	3		92	36	0	2
East South Central States:								
Kentucky	5				90		1	
Tennessee	3	3	27	10	53	17	0	1
Alabama	4	11	75	7	127	142	0	0
Mississippi	2	3						
West South Central States:								
Arkansas		4	63	17	34	73	0	0
Louisiana	0	12	25	16	36	67	0	0
Oklahoma [3]	4	8	17	40	53	276	1	0
Texas	3	17	17	19	86	80	0	0

[1] New York City only. [2] Week ended Friday. [3] Exclusive of Tulsa.

***Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 23, 1928, and June 25, 1927*—Continued**

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 23, 1928	Week ended June 25, 1927	Week ended June 23, 1928	Week ended June 25, 1927	Week ended June 23, 1928	Week ended June 25, 1927	Week ended June 23, 1928	Week ended June 25, 1927
Mountain States:								
Montana	8	4			2	9	3	2
Idaho	1	1			6	6	0	0
Wyoming			1		2	36	0	0
Colorado		12			59	54	1	0
New Mexico		3			5	31	0	0
Arizona	5	1					2	0
Utah [2]	3	7				11	1	0
Pacific States:								
Washington	8	6			65	371	1	4
Oregon	8	10		4	40	115	0	2
California	72	98	23	12	38	402	2	2

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 23, 1928	Week ended June 25, 1927	Week ended June 23, 1928	Week ended June 25, 1927	Week ended June 23, 1928	Week ended June 25, 1927	Week ended June 23, 1928	Week ended June 25, 1927
New England States:								
Maine	0	0	25	19	0	0	2	1
New Hampshire	0		12		0		0	
Vermont	0	0	8	2	0	0	0	0
Massachusetts	3	3	135	362	0	0	4	4
Rhode Island	0	0	9	18	0	0	2	0
Connecticut	1	0	30	48	0	0	1	0
Middle Atlantic States:								
New York	2	7	326	450	5	4	17	10
New Jersey	0	3	104	202	0	0	3	1
Pennsylvania	3	0	248	305	0	1	15	14
East North Central States:								
Ohio	2		74		16		4	
Indiana	2	1	42	48	54	96	5	7
Illinois	0	1	173	205	25	25	11	19
Michigan	1	1	191	214	45	32	7	5
Wisconsin	0	2	110	76	9	10	1	3
West North Central States:								
Minnesota	1	1	73	98	3	1	1	3
Iowa	0		23		20		5	
Missouri	0	0	58	30	2	29	10	10
North Dakota	1	0	18	19	1	5	0	1
South Dakota	1	0	7	11	5	9	0	1
Nebraska	0	0	33	8	20	6	0	4
Kansas	0	1	37	38	43	20	2	4
South Atlantic States:								
Delaware	0	0	1	0	0	0	0	1
Maryland [2]	2	0	36	33	0	0	7	11
District of Columbia	0	0	22	14	0	10	0	1
Virginia								
West Virginia	1	0	18	25	12	28	4	14
North Carolina	0	0	10	13	20	25	14	52
South Carolina	4	5	1	3	1	3	72	97
Georgia	0	1	7	12	0	6	29	49
Florida	0	2	1	4	2	12	7	4
East South Central States:								
Kentucky	1		23		8		5	
Tennessee	1	4	10	6	11	4	18	82
Alabama	0	3	4	12	2	6	21	69
Mississippi	0	0	4	2	0	1	26	30
West South Central States:								
Arkansas	0	1	5	1	1	1	13	30
Louisiana	1	1	4	4	10	4	29	26
Oklahoma [3]	0	3	25	8	29	59	18	49
Texas	0	4	25	6	16	10	5	33
Mountain States:								
Montana	1	0	3	8	20	14	2	2
Idaho	1	0	2	3	5	9	2	1
Wyoming	0	0	9	13	1	1	5	0
Colorado	0	0	12	60	5	2	0	3
New Mexico	0	1	11	5	4	0	12	4
Airzona	0	1	0	1	2	0	2	1
Utah [2]	0	0	5	8	3	3	0	0
Pacific States:								
Washington	0	0	23	42	16	26	3	3
Oregon	1	0	11	8	39	17	0	5
California	3	24	102	108	19	8	13	16

[2] Week ended Friday.

[3] Exclusive of Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
May, 1928										
Iowa	4	38			51		0	233	211	2
Maryland	1	154	85		3,125		4	289	2	29
Minnesota	15	74	35		437		4	535	14	4
Ohio	32	370	663	1	4,739		9	914	165	21

May, 1928.	Cases
Chicken pox:	
Iowa	142
Maryland	358
Minnesota	326
Ohio	969
Dysentery:	
Maryland	3
Minnesota	1
German measles:	
Maryland	535
Ohio	64
Impetigo contagiosa:	
Maryland	2
Lead poisoning:	
Ohio	9
Lethargic encephalitis:	
Maryland	1
Minnesota	5
Ohio	5
Mumps:	
Iowa	255
Maryland	320
Ohio	953
Ophthalmia neonatorum:	
Maryland	2
Ohio	93
Paratyphoid fever:	
Ohio	1

May, 1928—Continued.	Cases
Puerperal septicemia:	
Ohio	3
Rabies in animals:	
Maryland	5
Rabies in man:	
Iowa	1
Scabies:	
Maryland	1
Septic sore throat:	
Maryland	10
Ohio	65
Tetanus:	
Maryland	3
Ohio	3
Trachoma:	
Minnesota	8
Ohio	11
Tularaemia:	
Maryland	1
Undulant (Malta) fever:	
Iowa	2
Minnesota	1
Vincent's angina:	
Maryland	13
Whooping cough:	
Iowa	39
Maryland	265
Minnesota	297
Ohio	548

RECIPROCAL NOTIFICATIONS

Notifications regarding communicable diseases sent during the month of May, 1928, by departments of health of certain States to other State health departments

Disease	California	Illinois	Minnesota	New Hampshire	New Jersey	New Mexico	New York	Washington
Diphtheria		2						
Dysentery (amebic)			1					
Encephalitis (epidemic)			1					
Measles							1	
Scarlet fever							3	
Smallpox	1	4		1	1			1
Tuberculosis	2		50					
Typhoid fever						1		
Undulant (Malta) fever			1					

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 98 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,560,000. The estimated population of the 93 cities reporting deaths is more than 30,900,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended June 9, 1928, and June 11, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	1,337	1,520	
98 cities	808	959	791
Measles:			
42 States	13,859	9,192	
98 cities	6,191	2,529	
Poliomyelitis:			
43 States	30	30	
Scarlet fever:			
43 States	2,682	3,078	
98 cities	1,193	1,426	902
Smallpox:			
43 States	683	631	
98 cities	66	120	89
Typhoid fever:			
43 States	313	609	
98 cities	55	65	70
Deaths reported			
Influenza and pneumonia:			
93 cities	848	577	
Smallpox:			
93 cities	0	0	

City reports for week ended June 9, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
NEW ENGLAND									
Maine:									
Portland	76,400	9	2	0	0	1	17	4	1
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	7	0	0
Manchester	84,000	0	1	0	0	0	0	0	2

[1] Estimated, July 1, 1925.

City reports for week ended June 9, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND—con.									
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Burlington	[1] 24,089	2	1	0	0	0	9	0	0
Massachusetts:									
Boston	787,000	38	44	28	8	2	51	3	47
Fall River	131,000	2	3	1	0	0	22	1	4
Springfield	145,000	5	2	0	0	0	2	11	1
Worcester	193,000	14	3	2	0	1	41	17	0
Rhode Island:									
Pawtucket	71,000	0	0	1	0	0	15	15	1
Providence	275,000	0	6	3	2	0	150	1	4
Connecticut:									
Bridgeport	([2])	1	5	3	0	0	12	0	5
Hartford	164,000	0	5	4	0	1	66	6	6
New Haven	182,000	8	1	0	0	1	31	23	4
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	10	8	17	-------	0	41	27	23
New York	5,924,000	157	240	296	52	19	2,121	27	194
Rochester	321,000	5	9	3	-------	0	145	30	3
Syracuse	185,000	23	4	5	-------	0	72	12	4
New Jersey:									
Camden	131,000	1	5	11	1	0	37	3	3
Newark	459,000	26	10	50	4	1	128	8	12
Trenton	134,000	3	3	0	0	2	21	0	1
Pennsylvania:									
Philadelphia	2,008,000	62	61	51	0	8	954	43	44
Pittsburgh	637,000	29	17	18	0	7	77	52	18
Reading	114,000	6	2	1	0	1	30	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	3	7	8	1	0	8	0	13
Cleveland	960,000	70	24	26	5	4	134	38	25
Columbus	285,000	6	3	1	0	0	83	1	1
Toledo	295,000	25	4	1	0	0	73	1	5
Indiana:									
Fort Wayne	99,900	0	2	3	0	1	0	0	5
Indianapolis	367,000	18	3	1	0	0	151	27	8
South Bend	81,700	0	1	2	0	0	2	0	3
Terre Haute	71,900	3	1	0	0	0	4	0	3
Illinois:									
Chicago	3,048,000	97	68	80	21	13	47	40	65
Springfield	64,700	5	1	1	1	1	0	1	0
Michigan:									
Detroit	[1] 1,242,044	44	42	35	6	3	400	17	24
Flint	136,000	9	3	1	0	0	204	9	4
Grand Rapids	156,000	1	2	0	0	2	15	2	0
Wisconsin:									
Kenosha	52,700	26	1	0	0	0	1	0	0
Milwaukee	517,000	82	12	6	1	1	1	11	24
Racine	69,400	1	1	0	1	1	2	1	1
Superior	[1] 39,671	0	0	1	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	4	0	1	0	3	0	2	2
Minneapolis	434,000	53	14	3	0	1	53	101	5
St. Paul	248,000	6	9	0	0	1	17	11	10
Iowa:									
Davenport	[1] 52,469	2	1	0	0	-------	0	0	-------
Des Moines	146,000	0	1	0	0	-------	0	0	-------
Sioux City	78,000	3	0	0	0	-------	0	10	-------
Waterloo	36,900	-------	0	-------	-------	-------	-------	-------	-------
Missouri:									
Kansas City	375,000	22	5	4	0	1	36	10	11
St. Joseph	78,400	1	0	0	0	0	0	0	1
St. Louis	830,000	7	33	15	0	0	185	15	-------

[1] Estimated, July 1, 1925.
[2] No estimate made.

City reports for week ended June 9, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
WEST NORTH CENTRAL—continued									
North Dakota:									
Fargo	[1] 26,403	1	0	0	0	0	0	0	0
Grand Forks	[1] 14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	1	0	0	0		0	0	
Sioux Falls	[1] 30,127	0	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	3	1	2	0	0	0	0	0
Omaha	216,000	9	?	2	0	0	0	1	1
Kansas:									
Topeka	56,500	12	1	0	1	1	4	4	1
Wichita	92,500	3	1	0	0	0	10	5	0
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	2	1	2	0	0	30	3	1
Maryland:									
Baltimore	808,000	37	19	31	2	1	126	59	24
Cumberland	[1] 33,741	2	0	0	0	0	2	0	1
Frederick	[1] 12,035	0	0	0	0	0	6	0	0
District of Columbia:									
Washington	528,000	8	8	18	1	1	192	0	11
Virginia:									
Lynchburg	[1] 38,493	2	0	1	0	0	14	6	2
Norfolk	174,000	2	0	0	0	0	9	0	5
Richmond	189,000	1	1	1	0	1	39	2	4
Roanoke	61,900	4	1	0	0	0	12	0	2
West Virginia:									
Charleston	50,700	4	0	1	1	0	0	0	1
Wheeling	[1] 56,208	1	0	0	0	0	10	0	2
North Carolina:									
Raleigh	[1] 30,371	1	0	0	0	0	17	0	0
Wilmington	37,700	3	0	0	0	0	0	0	4
Winston-Salem	71,800	0	0	0	0	0	5	7	0
South Carolina:									
Charleston	74,100	0	0	0	2	0	2	0	3
Columbia	41,800	5	0	1	0	2	0	8	1
Greenville	[1] 27,311	0	0	0	0	0	0	3	0
Georgia:									
Atlanta	([2])	3	1	1	9	0	11	4	
Brunswick	[1] 16,809	3	0	0	0	0	0	7	7
Savannah	94,900	2	0	0	7	0	0	1	0
Florida:									4
Miami	[3] 131,286	1	4	2	0	0	5	1	2
St. Petersburg	[3] 47,629		0			0			1
Tampa	102,000	0	0	0	0	0	0	0	2
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	0	0	1	0	1	1	0	3
Louisville	311,000	0	2	0	0	0	91	5	9
Tennessee:									
Memphis	177,000	1	1	1	0	1	3	4	1
Nashville	137,000	1	0	0	0	1	19	1	3
Alabama:									
Birmingham	211,000	5	1	0	9	7	30	2	13
Mobile	66,800	0	1	1	0	0	6	0	1
Montgomery	47,000	0	0	1	1		3	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	1	1	0	0		0	0	
Little Rock	75,900	4	0	0	0	0	2	0	2
Louisiana:									
New Orleans	419,000	1	5	10	3	6	0	0	6
Shreveport	59,500	0	0	1	0	0	2	6	2
Oklahoma:									
Tulsa	133,000	1	0	0	0		3	2	

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended June 9, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
WEST SOUTH CENTRAL—continued									
Texas:									
Dallas	203,000	3	3	2	0	1	9	0	0
Fort Worth	159,000	8	1	0	0	1	1	1	3
Galveston	49,100	0	0	0	0	0	0	0	2
Houston	[1] 164,954	0	2	2	0	0	1	0	6
San Antonio	205,000	0	1	0	0	1	1	0	8
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	0
Great Falls	[1] 29,883	0	0	0	0	0	11	0	0
Helena	[1] 12,037	0	0	0	0	0	0	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	1	0	0	0	0	0	0	0
Colorado:									
Denver	285,000	39	8	3	--------	0	51	74	8
Pueblo	43,900	10	1	0	0	0	20	0	1
New Mexico:									
Albuquerque	[1] 21,000	0	0	0	0	0	2	0	0
Utah:									
Salt Lake City	133,000	16	4	1	0	0	1	0	1
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	35	5	6	0	--------	15	9	--------
Spokane	109,000	32	2	3	0	--------	0	0	--------
Tacoma	106,000	2	2	0	0	0	23	29	1
Oregon.									
Portland	[1] 282,383	22	5	4	0	0	17	4	6
California:									
Los Angeles	(2)	67	38	26	14	1	20	24	17
Sacramento	73,400	6	3	0	0	0	0	10	3
San Francisco	567,000	37	15	10	6	1	10	31	3

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	1	3	0	0	0	0	0	0	0	3	18
New Hampshire:											
Concord	0	2	0	0	0	1	0	0	0	0	9
Manchester	0	0	0	0	0	2	0	0	0	0	21
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	3
Burlington	0	0	0	0	0	0	0	0	0	0	10
Massachusetts:											
Boston	49	67	0	0	0	12	2	1	0	24	246
Fall River	2	6	0	0	0	1	1	0	0	6	26
Springfield	5	12	0	0	0	1	0	0	0	0	27
Worcester	7	10	0	0	0	1	1	0	0	8	44
Rhode Island:											
Pawtucket	1	2	0	0	0	0	0	0	0	2	16
Providence	7	21	0	0	0	3	0	0	0	1	65
Connecticut:											
Bridgeport	8	0	0	0	0	1	0	0	0	8	25
Hartford	3	3	0	0	0	0	0	0	0	9	41
New Haven	4	0	0	0	0	4	1	0	0	11	49

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended June 9, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
MIDDLE ATLANTIC											
New York:											
Buffalo	16	28	0	0	0	0	1	11	10	28	161
New York	180	225	0	0	0	93	10	7	0	142	1,536
Rochester	11	5	0	0	0	1	0	0	1	4	72
Syracuse	6	8	0	0	0	2	0	0	0	17	51
New Jersey:											
Camden	5	6	0	0	0	5	0	0	0	0	34
Newark	18	22	0	0	0	8	0	0	0	19	118
Trenton	2	0	0	0	0	4	1	0	0	0	36
Pennsylvania:											
Philadelphia	74	66	1	0	0	40	3	3	1	85	496
Pittsburgh	27	20	1	0	0	8	1	0	0	24	181
Reading	2	11	0	0	0	1	0	0	0	6	28
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	11	32	2	2	0	8	1	0	0	3	139
Cleveland	27	11	1	1	0	14	1	4	0	51	214
Columbus	6	1	1	0	0	4	0	0	0	5	66
Toledo	11	5	1	0	0	5	0	0	0	6	68
Indiana:											
Fort Wayne	2	2	2	0	0	1	0	0	0	1	26
Indianapolis	7	13	10	1	0	7	1	0	0	5	105
South Bend	2	0	1	0	0	0	0	0	0	0	15
Terre Haute	2	1	0	5	0	0	0	0	0	0	19
Illinois:											
Chicago	93	99	1	1	0	54	3	4	1	54	706
Springfield	2	9	0	1	0	0	0	0	0	8	22
Michigan:											
Detroit	65	121	2	0	0	83	2	2	0	79	282
Flint	5	14	0	3	0	1	0	0	0	9	29
Grand Rapids	5	5	0	0	0	2	0	0	0	3	31
Wisconsin:											
Kenosha	1	0	0	0	0	0	0	0	0	23	6
Milwaukee	17	49	1	0	0	6	0	0	0	37	133
Racine	3	1	0	0	0	1	0	0	0	2	11
Superior	2	4	1	0	0	0	0	0	0	0	-------
WEST NORTH CENTRAL											
Minnesota:											
Duluth	6	9	2	0	0	0	0	2	0	4	23
Minneapolis	27	24	7	0	0	1	1	0	0	34	81
St. Paul	18	8	2	0	0	7	0	0	0	60	60
Iowa:											
Davenport	0	1	1	0	-------	-------	0	0	-------	0	-------
Des Moines	5	7	3	10	-------	-------	0	0	-------	0	32
Sioux City	1	2	2	0	-------	-------	0	0	-------	3	-------
Waterloo	1	-------	0	-------	-------	-------	0	-------	-------	-------	-------
Missouri:											
Kansas City	6	13	1	0	0	9	1	0	0	9	104
St. Joseph	0	1	0	2	0	1	0	0	0	0	28
St. Louis	22	15	2	3	0	20	2	0	0	17	238
North Dakota:											
Fargo	1	3	0	0	0	0	0	0	0	4	6
Grand Forks	0	2	0	0	-------	-------	0	0	-------	0	-------
South Dakota:											
Aberdeen	2	0	0	0	-------	-------	0	0	-------	0	-------
Sioux Falls	1	0	0	0	-------	-------	0	0	-------	0	4
Nebraska:											
Lincoln	1	5	0	2	0	0	1	0	0	3	17
Omaha	4	6	5	4	0	1	0	0	1	2	30
Kansas:											
Topeka	1	3	0	0	0	0	0	0	0	1	9
Wichita	1	0	0	2	0	1	1	0	0	5	20

City reports for week ended June 9, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
SOUTH ATLANTIC											
Delaware:											
Wilmington	3	0	0	0	0	2	1	0	0	1	25
Maryland:											
Baltimore	26	15	0	0	0	12	2	1	2	56	226
Cumberland	0	1	0	0	0	0	0	0	0	0	8
Frederick	0	0	0	0	0	0	0	0	0	0	1
District of Columbia:											
Washington	15	44	1	1	0	8	2	0	0	17	146
Virginia:											
Lynchburg	0	0	0	0	0	0	0	0	0	1	17
Norfolk	1	3	0	1	0	2	0	0	0	0	-------
Richmond	2	6	0	0	0	6	1	1	0	3	54
Roanoke	0	1	1	0	0	3	0	0	0	0	18
West Virginia:											
Charleston	0	1	0	0	0	1	0	0	1	4	17
Wheeling	2	0	0	0	0	0	1	0	0	0	15
North Carolina:											
Raleigh	0	1	0	3	0	0	1	0	0	7	8
Wilmington	0	0	0	2	0	0	0	1	0	0	18
Winston-Salem	1	6	1	1	0	0	1	0	0	0	-------
South Carolina											
Charleston	0	0	0	7	0	1	0	0	0	0	19
Columbia	0	0	1	0	0	0	2	0	0	3	16
Greenville	0	0	0	0	0	0	1	0	0	2	10
Georgia:											
Atlanta	3	5	6	2	0	7	2	0	0	0	95
Brunswick	0	1	0	0	0	0	1	0	0	0	5
Savannah	0	1	0	0	0	3	2	1	0	0	26
Florida:											
Miami	0	0	0	0	0	2	1	0	0	2	18
St. Petersburg	0	-------	0	-------	0	0	0	-------	0	-------	9
Tampa	1	0	0	0	0	1	1	2	0	0	28
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	3	0	0	0	0	0	0	0	0	28
Louisville	5	45	1	0	0	7	1	0	0	0	91
Tennessee:											
Memphis	3	4	1	0	0	9	1	2	0	1	63
Nashville	1	0	1	5	0	2	1	0	2	0	48
Alabama:											
Birmingham	1	0	5	0	0	6	2	0	0	8	77
Mobile	0	0	1	0	0	1	1	0	0	0	20
Montgomery	0	0	1	0	-------	-------	1	0	-------	2	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	2	0	0	-------	-------	0	0	-------	10	-------
Little Rock	1	4	1	0	0	7	1	0	0	0	-------
Louisiana:											
New Orleans	3	7	1	1	0	14	2	4	0	4	165
Shreveport	0	1	1	0	0	3	1	2	2	1	27
Oklahoma:											
Tulsa	0	4	1	1	-------	-------	1	1	-------	1	-------
Texas:											
Dallas	2	6	2	3	0	1	1	1	0	29	39
Fort Worth	1	3	1	1	0	0	1	0	1	0	38
Galveston	0	0	0	0	0	0	0	0	0	0	15
Houston	0	2	0	2	0	3	1	1	0	0	72
San Antonio	0	1	0	0	0	8	1	0	0	0	67
MOUNTAIN											
Montana:											
Billings	2	0	0	0	0	0	0	0	0	1	3
Great Falls	1	1	1	0	0	0	0	0	0	0	10
Helena	0	1	0	2	0	1	0	0	0	0	7
Missoula	0	0	0	0	0	0	0	0	0	0	5

City reports for week ended June 9, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough cases reported	Deaths, all causes
MOUNTAIN—con.											
Idaho:											
Boise	0	0	0	0	0	0	0	0	0	0	9
Colorado:											
Denver	9	7	1	0	0	7	0	1	0	31	72
Pueblo	1	0	0	0	0	1	0	0	0	0	9
New Mexico:											
Albuquerque	0	0	0	0	0	3	0	0	0	0	8
Utah:											
Salt Lake City	2	3	1	6	0	0	0	0	0	12	30
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	9	5	2	0			1	2		8	
Spokane	4	6	3	5			0	0		1	
Tacoma	2	7	3	0	0	2	0	0	0	0	26
Oregon:											
Portland	4	3	7	16	0	4	0	0	0	0	103
California:											
Los Angeles	22	14	6	0	0	25	2	0	0	89	238
Sacramento	1	5	1	0	0	1	1	0	0	3	32
San Francisco	13	24	1	0	0	6	1	2	2	12	160

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis: Cases	Poliomyelitis: Deaths
NEW ENGLAND									
Massachusetts:									
Boston	2	1	0	0	1	1	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	31	11	2	2	0	0	1	0	0
New Jersey:									
Camden	0	0	0	1	0	0	0	0	0
Pennsylvania:									
Philadelphia	2	3	3	2	0	0	0	0	0
Pittsburgh	3	1	0	0	0	0	1	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	1	2	0	0	0	0	0	0	0
Cleveland	4	0	0	1	0	0	0	0	0
Columbus	0	0	0	0	0	0	0	1	0
Indiana:									
Indianapolis	1	1	0	0	0	0	0	0	0
Illinois:									
Chicago	5	2	2	2	0	0	0	1	0
Michigan:									
Detroit	4	3	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee	3	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Missouri:									
Kansas City	2	2	0	1	0	0	0	0	0
St. Louis	3	0	1	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	1	0	0	0	0	0	0

City reports for week ended June 9, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	1	0	0	0	1	1	0
North Carolina:									
Raleigh	0	0	0	0	0	1	0	0	0
Wilmington	0	0	0	0	0	1	0	0	0
South Carolina:									
Charleston [1]	0	1	0	0	1	0	0	0	0
Columbia	0	0	0	0	0	1	0	0	0
Georgia:									
Atlanta	1	0	0	0	4	0	0	0	0
Florida:									
Miami	0	0	0	0	1	0	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Mobile	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	0	0	0	0	1	0	0	0	0
Louisiana:									
New Orleans	1	0	0	0	7	0	0	0	0
Shreveport	0	0	0	0	0	1	0	0	0
Texas:									
Houston	0	2	0	0	0	0	0	0	0
San Antonio	0	0	0	0	0	1	0	0	0
MOUNTAIN									
Colorado:									
Denver	1	0	0	0	0	0	0	0	0
PACIFIC									
California:									
Los Angeles	0	0	0	0	1	1	0	0	0
Sacramento	0	0	0	0	2	3	0	0	0
San Francisco	1	1	0	0	0	0	0	0	0

[1] Dengue: 1 case at Charleston, S. C.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended June 9, 1928, compared with those for a like period ended June 11, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, May 6 to June 9, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927	June 9, 1928	June 11, 1927
101 cities	121	174	137	174	128	171	122	158	[3] 134	[3] 161
New England	113	105	110	153	64	160	99	160	97	133
Middle Atlantic	177	282	204	267	213	233	178	234	220	247
East North Central	109	132	114	160	102	145	105	123	108	125
West North Central	55	135	95	105	72	91	84	81	[2] 50	81
South Atlantic	82	115	103	110	109	144	93	120	98	[3] 124
East South Central	35	81	20	35	35	96	45	61	20	20
West South Central	92	112	64	50	28	83	56	66	60	45
Mountain	71	99	97	108	71	143	71	179	35	368
Pacific	102	94	120	104	92	196	107	128	115	125

MEASLES CASE RATES

	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927	June 9, 1928	June 11, 1927
101 cities	1,376	602	1,346	620	1,305	548	1,215	447	[3] 1,025	[3] 425
New England	1,120	346	1,159	416	1,290	435	1,129	314	952	458
Middle Atlantic	2,254	297	2,274	323	2,185	365	2,164	282	1,767	298
East North Central	788	450	680	492	773	372	661	324	668	295
West North Central	937	932	1,116	952	939	653	752	459	[2] 609	372
South Atlantic	1,704	1,546	1,436	1,537	1,219	1,358	1,021	1,001	833	[3] 847
East South Central	1,082	345	1,237	355	1,077	319	1,037	386	763	157
West South Central	336	567	268	620	260	459	176	496	60	418
Mountain	1,141	1,300	1,150	906	831	1,049	991	619	734	565
Pacific	327	1,259	263	1,215	304	1,060	217	1,094	174	1,136

SCARLET FEVER CASE RATES

	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927	June 9, 1928	June 11, 1927
101 cities	253	340	253	309	234	294	206	219	[2] 197	[3] 240
New England	347	439	292	432	306	365	248	288	200	323
Middle Atlantic	285	474	279	415	267	363	200	255	190	280
East North Central	265	289	272	267	254	301	228	212	237	247
West North Central	242	319	279	289	207	245	232	236	[2] 162	194
South Atlantic	167	148	195	101	163	121	184	78	149	[3] 100
East South Central	155	152	190	132	219	137	284	101	259	66
West South Central	184	21	216	33	204	25	144	21	92	33
Mountain	115	726	133	986	18	897	71	780	106	717
Pacific	204	201	143	167	130	209	148	185	156	204

SMALLPOX CASE RATES

	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927	June 9, 1928	June 11, 1927
101 cities	18	21	24	26	17	20	13	21	[2] 11	[3] 20
New England	0	0	0	0	9	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	20	20	22	37	16	49	10	33	9	21
West North Central	43	26	64	48	27	42	29	24	[2] 22	32
South Atlantic	21	38	32	36	26	40	12	32	30	[3] 20
East South Central	45	56	30	76	60	61	45	91	25	106
West South Central	8	58	60	17	24	29	24	17	24	8
Mountain	159	9	159	45	133	27	58	36	71	27
Pacific	36	91	54	71	38	84	49	60	13	91

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1 1928 and 1927, respectively.
[2] Waterloo, Iowa, and Fargo, N. Dak., not included.
[3] Greenville, S. C., not included.

Summary of weekly reports from cities, May 6 to June 9, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927	June 9, 1928	June 11, 1927
101 cities	8	8	6	10	8	9	12	13	[2] 9	[3] 11
New England	5	5	7	5	11	9	57	9	2	5
Middle Atlantic	2	5	4	6	6	6	1	5	10	6
East North Central	3	3	2	5	5	7	3	7	7	6
West North Central	8	2	2	6	4	4	4	12	[2] 4	14
South Atlantic	19	9	7	13	7	18	16	29	11	[3] 18
East South Central	20	66	20	56	10	30	65	61	10	41
West South Central	16	25	4	45	12	25	32	37	32	33
Mountain	18	9	0	9	0	18	0	9	9	0
Pacific	31	10	23	10	36	8	18	26	10	21

INFLUENZA DEATH RATES

	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927	June 9, 1928	June 11, 1927
95 cities	33	13	20	12	25	9	20	7	[4] 17	[3] 6
New England	16	14	41	14	18	9	16	2	14	0
Middle Atlantic	31	14	28	10	21	8	24	9	19	5
East North Central	43	10	36	12	33	4	21	4	17	4
West North Central	43	4	18	8	12	12	14	6	[4] 14	4
South Atlantic	9	25	16	11	11	13	9	16	9	[3] 9
East South Central	73	32	63	43	89	27	26	5	52	11
West South Central	37	13	16	25	33	25	25	17	33	25
Mountain	27	9	27	9	53	9	44	0	0	9
Pacific	17	7	10	0	7	3	7	3	7	7

PNEUMONIA DEATH RATES

	May 12, 1928	May 14, 1927	May 19, 1928	May 21, 1927	May 26, 1928	May 28, 1927	June 2, 1928	June 4, 1927	June 9, 1928	June 11, 1927
95 cities	210	123	189	110	176	100	145	93	[4] 126	[3] 93
New England	257	144	207	100	253	144	172	116	168	88
Middle Atlantic	267	151	218	119	211	116	182	107	147	112
East North Central	232	97	222	104	175	85	130	79	115	93
West North Central	120	70	88	58	84	87	59	58	[4] 64	50
South Atlantic	89	128	146	148	119	85	137	112	130	[3] 64
East South Central	193	128	240	112	230	64	204	53	157	117
West South Central	164	140	123	106	144	89	127	81	107	102
Mountain	133	54	97	63	124	36	106	72	88	90
Pacific	98	114	105	121	91	100	71	97	81	83

[2] Waterloo, Iowa, and Fargo, N. Dak., not included.
[3] Greenville, S. C., not included.
[4] Fargo, N. Dak., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1928 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31, 657, 000	31, 050, 300	30, 960, 700	30, 369, 500
New England	12	12	2, 274, 400	2, 242, 700	2, 274, 400	2, 242, 700
Middle Atlantic	10	10	10, 732, 400	10, 594, 700	10, 732, 400	10, 594, 700
East North Central	16	16	7, 991, 400	7, 820, 700	7, 991, 400	7, 820, 700
West North Central	12	10	2, 683, 500	2, 634, 500	2, 566, 400	2, 518, 500
South Atlantic	21	21	2, 981, 900	2, 890, 700	2, 981, 900	2, 890, 700
East South Central	7	6	1, 048, 300	1, 028, 300	1, 000, 100	980, 700
West South Central	8	7	1, 307, 600	1, 260, 700	1, 274, 100	1, 227, 800
Mountain	9	9	591, 100	581, 600	591, 100	581, 600
Pacific	6	4	2, 046, 400	1, 996, 400	1, 548, 900	1, 512, 100

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended June 2, 1928.—The following report for the week ended June 2, 1928, was transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported present in the following ports:

PLAGUE

Ceylon.—Colombo.
India.—Bassein, Bombay, Rangoon.
China.—Amoy.

CHOLERA

India.—Bassein, Calcutta, Madras, Moulmein, Rangoon.
Siam.—Bangkok.
French Indo-China.—Haiphong, Saigon.
China.—Canton.

SMALLPOX

India.—Bombay, Calcutta, Madras, Rangoon.
French India.—Pondicherry.
Dutch East Indies.—Bolawan-Deli.
China.—Shanghai, Hong Kong.
Japan.—Kobe.
Kwantung.—Dairen, Port Arthur.
Manchuria.—Changchun, Mukden.
Korea.—Fusan.

BRAZIL

Bahia—Interior of Province—Yellow fever.—Under date of June 20, 1928, three cases of yellow fever were reported at Bahia, with spread of the disease in the interior. Two of the reported cases at Bahia were stated to be mild.

CANADA

Provinces—Communicable diseases—Week ended June 2, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from five Provinces of Canada for the week ended June 2, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Alberta	Total
Cerebrospinal fever			2	3		5
Influenza	15			9		24
Lethargic encephalitis				2		2
Poliomyelitis				1		1
Smallpox			19	8	1	28
Typhoid fever			10	9		19

Quebec—Communicable diseases—Week ended June 9, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended June 9, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	17	Scarlet fever	85
Diphtheria	35	Smallpox	21
German measles	7	Tuberculosis	2
Influenza	4	Typhoid fever	12
Measles	136	Whooping cough	6

Vital statistics—April, 1928.—Births and deaths in the Province of Quebec for the month of April, 1928, were reported as follows:

Estimated population	2,650,400
Births	6,635
Birth rate per 1,000 population	30.5
Deaths	2,984
Death rate per 1,000 population	13.7
Deaths under 1 year	886
Infant mortality rate	133.5
Deaths from—	
Cancer	125
Cerebrospinal meningitis	5
Diabetes	22
Diarrhea	112
Diphtheria	27
Heart disease	248
Influenza	100
Measles	40
Pneumonia	371
Poliomyelitis	2
Scarlet fever	17
Smallpox	0
Syphilis	5
Tuberculosis (pulmonary)	279
Tuberculosis (all other forms)	55
Typhoid fever	16
Violence	67
Whooping cough	30

GREAT BRITAIN

England and Wales—Vital statistics—January to March, 1928.—During the first quarter of the year 1928, 168,099 births and 136,315 deaths were registered in England and Wales, giving a birth rate on an annual basis, of 17.4 per 1,000 population and a death rate of 14.1 per 1,000. The infant mortality was 80 per 1,000 births.

During the 13 weeks ended March 31, 1928, communicable diseases were notified in England and Wales as follows:

Disease	Cases	Disease	Cases
Diphtheria	18,433	Puerperal pyrexia	1,526
Ophthalmia neonatorum	1,437	Scarlet fever	23,411
Pneumonia	22,296	Smallpox	4,730
Puerperal fever	630	Typhoid fever	622

Scotland—Vital statistics—January to March, 1928.—The Registrar-General of Scotland has published statistics for the first quarter of 1928 which show that the birth rate for Scotland for that quarter was 19.9 per 1,000 population, the death rate 15.9 per 1,000, and the deaths of infants under 1 year of age was 107 per 1,000 births.

The following items are taken from quarterly returns of births, deaths, and marriages registered in Scotland during the quarter ended March 31, 1928:

Births	24,246
Marriages	7,382
Deaths (total)	19,385
Deaths under 1 year	2,594
Deaths from—	
Bronchitis	1,290
Bronchopneumonia	1,017
Cancer	1,736
Cerebrospinal meningitis	42
Diabetes	133
Diarrhea and enteritis (under 2 years)	145
Diphtheria	191
Dysentery	2
Heart disease	2,397
Influenza—	
Sole cause	81
With other causes	350
Lethargic encephalitis	24
Malaria	2
Measles	558
Nephritis (acute)	59
Nephritis (chronic)	485
Paratyphoid fever	6
Pneumonia	1,030
Poliomyelitis	0
Puerperal sepsis	72
Scarlet fever	47
Syphilis	29
Tetanus	2
Tuberculosis (pulmonary)	848
Tuberculosis (all other forms)	391
Typhoid fever	12
Whooping cough	361

GREECE

Corfu—Plague—June 20, 1928.—Under date of June 20, 1928, 15 cases of plague with 3 deaths were reported at Corfu, Greece.

NOVA SCOTIA

Halifax—Communicable diseases—1926-27.—The report of the City Health Department of Halifax, Nova Scotia, for the year ended April 30, 1928, shows a decided decrease in the prevalence of communicable diseases as compared with the preceding year.

The numbers of reported cases of certain communicable diseases in Halifax for the years ended April 30, 1927, and April 30, 1928, are shown in the table below:

Disease	1926-27	1927-28	Disease	1926-27	1927-28
Cancer	4	1	Poliomyelitis	1	2
Cerebrospinal meningitis	1	2	Scarlet fever	193	162
Chicken pox	9	13	Smallpox	0	2
Diphtheria	123	84	Tuberculosis	20	17
Erysipelas	1		Typhoid fever	1	6
Measles	296	20	Whooping cough	100	4
Paratyphoid fever		2			

VENEZUELA

Births and deaths, 1922-1926.—The following table gives the numbers of births and deaths in Venezuela for the years 1922 to 1926, inclusive. The population of Venezuela is given as 2,490,604 in 1923 and 3,026,878 in 1926.

Year	Births	Deaths	Year	Births	Deaths
1922	76,385	56,498	1925	95,741	51,782
1923	82,137	54,509	1926	91,648	60,002
1924	81,750	54,261			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths, P, present]

Place		Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928: 17	24	31	April, 1928: 7	14	21	28	May, 1928: 5	12	19	26	June, 2, 1928
China:																		
Canton	C	12	1					1	1									1
	D	11	1					1	1									1
Swatow	C	P																
	D	P																
Tientsin	C	P	1															
Dutch East Indies: Java—Batavia	C	28	3															
	D	18	3															
India	C	23,047	25,139	15,377	12,391	13,236	4,546	5,384	5,856	5,529	7,746	7,897						
	D	12,863	15,026	8,863	6,750	7,282	2,605	2,931	3,182	3,159	4,920	5,157						
Bassein	D				1	2		4	25	22	20	6	6	9	9	16	8	7
Bombay	C	2			1	1	1	1	1									
	D	2				1	1		1	1								
Calcutta	C	199	428	156	203	341	164	190	148	162	163	131	152					
	D	138	281	125	112	241	94	122	114	112	111	97	105	115	126	102	92	90
Madras	C	13	1	1	2	14		7	1	2	5	5	5	7	7			
	D	7	2	1	4	18		2	1	1	4	5	4	5	3		5	4
Madras Presidency	C	3,073	3,702	1,864	4,681	2,961	510	455	243	275								
	D	1,736	2,104	984	2,660	1,618	280	244	131	157								
Negapatam	C				4	4												
	D				6	4					1			1				
Rangoon	C	2	8	4	6	29	4	7	8	3	5	10	7	1				
	D	5	6	3	2	18	2	3	6	5	2	7	5	1				2
Tuticorin	C		8							10	43	45	19	3				
	D	37	14				1			8	26	32	10	3				
India (French):																		
Chandernagor	C	6	10	14	6	5	2	1		4								
	D	6	10	9	1	5	1	1		4								
Karikal	C	1	1	8	32	6					1							
	D	1	1	4	19	5					1							
Pondicherry	C	1	25	11	12	33				1	2	3	2	1				
	D	1	21	12	10	19				1	2	3	2	1				

Indo-China (see also table below):																		
Saigon	C			3	4	16	27	13	21	35	50	28	23	15	10		4	1
	D			1	1	8	19	8	12	20	37	17	12	10	7		2	
Iraq [1]																		
Kwangchow-Wan (see table below)																		
Siam	C	110	88	110	200	295	53	88	70	80	120	85	88	56	46			
	D	76	64	80	139	214	39	67	54	58	84	61	63	26	29			
Bangkok	C	4	3	21	101	60	8	12	16	24		30	24	20	17	14	11	8
	D	2	2	11	66	36	5	5	12	11		13	14	8	6	9	7	4
Trad [2]	C																	
Straits Settlements: Singapore	C	7	5	23	3		1	1					1					
	D	5	4	12	1		1	1					1					
On vessel:																		
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C									11								

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928			March, 1928			April, 1928			May, 1928		
					1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31
Indo-China (French) (see also table above):																
Annam	C	3,179	370	267	23	36	14	18	18	23	17	11	18	4	26	13
Cambodia	C	251	337	54	38	22	51	33	22	92	43	102	51	34	47	20
Cochin-China	C	469	391	295	178	113	153	206	217	245	277	316	240	140	139	125
Laos	C	246	77													
Tonkin	C	1,297	3	1							1	4	1	9	1	16
Kwangchow-Wan	C	16													16	

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Nov. 20-Dec. 17, 1927	Dec. 18, 1927-Jan. 14, 1928	Jan. 15-Feb. 11, 1928	Feb. 12-Mar. 10, 1928	Week ended—														
						March, 1928			April, 1928				May, 1928				June, 1928			
						17	24	31	7	14	21	28	5	12	19	26	2	9	16	23
Algeria (see also table below):																				
Algiers	C												1							
Oran	C													1				2		

[1] From July 19 to Dec. 26, 1927, 1,479 cases of cholera were reported in Iraq, with 1,063 deaths, as follows: Amarah Liwa, 261 cases, 205 deaths; Baghdad Liwa, 80 cases, 60 deaths; Basra Liwa, 421 cases, 330 deaths; Diwaniah Liwa, 122 cases, 72 deaths; Diyalah Liwa, 1 case, 1 death, Duliam Liwa, 100 cases, 69 deaths; Hillah Liwa, 105 cases, 71 deaths; Kerbalah Liwa, 79 cases, 60 deaths; Kut Liwa, 66 cases, 44 deaths; Muntafiq Liwa, 244 cases, 151 deaths.

[2] 1 death from cholera reported June 15 as first case from Trad, Siam.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928: 17	March, 1928: 24	March, 1928: 31	April, 1928: 7	April, 1928: 14	April, 1928: 21	April, 1928: 28	May, 1928: 5	May, 1928: 12	May, 1928: 19	May, 1928: 26	June, 1928: 2	June, 1928: 9	June, 1928: 16	June, 1928: 23
Arabia: Aden	C		19	178	343	189	148	151	163	108	59	53	13	5	1	1				
	D		7	104	206	134	135	134	126	97	48	16	16	7	1	1				
Plague-infected rats				P	P															
Argentina:																				
Avellaneda	C																1			
	D																1			
Bahia Blanca district	C	3																		
Buenos Aires	C			2										(1)	6					
	D														3					
Cordoba Province	C	10	2							5										
Entre Rios	C																	2	1	
Firmat	C	1																		
Loreto	C																3			
Quilino	C	3																		
Rosario	C	4	5	4	1												1			
Santa Fe	C																	7	1	
Santiago del Estero	C				1													9	1	
Suardi	C																2			
Ucacha	C	1																		
Azores: St. Michaels Island	C	3	2	8	3	1	1		1		2	1	2							
	D	1	1	4	1	1			1		1	1								
Brazil:																				
Bahia	C		4	5	8			P	2	1										
	D		4	4	5															
Porto Alegre	C				2															
Rio de Janeiro	C			4	3	2	1													
	D			1	2	2	1													
Plague-infected rats				1																
British East Africa (see also table below):																				
Tanganyiki	C	P	P	2	3															
	D			2	3					5			5							
Uganda	C	67	79	23	13															
	D	61	64	18	10															

Canary Islands:																				
Arrecife	C														1					
	D														1					
Las Palmas	C	3	3	1	1	2		2												
	D	1	1	1	1															
Teneriffe	C				10															
	D				4															
Ceylon: Colombo	C	6	7	3	11	3		4					1	1	2		1			
	D	6	6	2	6	3		2					1	1	1					
Plague-infected rats			2	5	6															
China:																				
Amoy	C													1	1	2	1			
Hong Kong	C												2							
Dutch East Indies:																				
Balik-Papan	C		1																	
	D		1																	
Celebes—Makassar	C	2	6	5	1															
	D	2	5	5	1															
Java	D	1,017	754	737	454															
Batavia and West Java	C	154	128	137	103	19	18	17	26	13	10	14								
	D	152	128	135	103	19	18	17	26	13	10	14								
Cheribon	C	1																		
	D	1																		
Plague-infected rats						1		1	1	1	3	2	1	1	4	2	2			
East Java and Madura	C	8	7	7		1	1	2		1	2									
	D	8	7	7		1	1	2		1	2									
Kedoe Residency	C									P										
Pasoeroean Residency	C	P																		
Surabaya Residency	C	P						1					1							
	D							1					1							
Surakarta Residency	C	P																		
Ecuador: Guayaquil (see table below).																				
Egypt:[1]																				
Alexandria	C	12	5	2	1											1				
	D	7	2	2	1											2				
Beni-Souef	C											4	8	4	14	34	17	14	3	
	D											1	2	4	6	8	5	7		
Cairo	C		2																	
	D		2																	
Maghagha District	C										1									
	D										1									
Menufia	C															6	5			
	D																2			
Minieh Province	C										32	9	7	13	15	36	12	22	23	
	D										5	4		5	2	9	1	9	5	
Suez	C		1	4	13		4	7	3		3	2			1	2				
	D		1	2	9		2	3	4		2	2			1					
Plague-infected rats							2													
Tanta	C														1					
	D														1					

[1] 6 cases of plague reported in Buenos Aires, Argentina, before May 14, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended—														
						March, 1928			April, 1928				May, 1928				June, 1928			
						17	24	31	7	14	21	28	5	12	19	26	2	9	16	23
Greece:																				
Athens and Piræus	C		3																	
	D		1																	
Corfu	C																		1	14
	D																			8
Mitylene	C	3																		
Hawaii Territory: Hawaii	D				1															
India	C	5,518	7,697	12,652	23,174	7,517	6,077	6,634	5,851	6,690	5,080									
	D	3,269	4,925	8,521	16,998	6,031	4,724	5,372	4,780	5,911	4,719									
Bassein	D	4	17	8	12	5	5	7	5	4	5	1	3	2	1		1			
Bombay	C		3	14	33	4	16	28	21	17										
	D		3	9	33	4	11	25	21	15	14	19	21	17	14		6			
Calcutta	C		2																	
	D			1					2											
Madras Presidency	C	791	550	452	271	25	19	13	5	14	6									
	D	359	206	256	212	18	16	9	5	7	5									
Rangoon	C	15	17	35	48	5	11	3	11	5	2	5	4	3						
	D	15	16	30	43	4	9	5	8	5	1	3	5	3	3	3		4		
Indo-China (see table below)																				
Iraq:																				
Baghdad	C			4	2	2	2	1		1	4	4	2	4	3	4	2	3	2	
	D			2	2	2	2	1		1		4	1		1	1	1	1	1	
Plague-infected rats												4		3						
Dulaim Liwa	C			1						1										
Kwangchow-Wan (see table below)																				
Madagascar (see table below)																				
Mauritius (see table below)																				
Nigeria (see also table below):																				
Lagos	C	18	10	10	8	2		2	3	2	6	7	2	4	8	6				
	D	13	8	11	8	2		2	2	2	7	7	2	4	8	6				
Peru (see table below)																				
Senegal (see also table below):																				
Baol	C	P																		
	D																			
Thies and vicinity	C							8												
	D							4												

Place																				
Siam	C	[illegible]	10	20	42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11	[illegible]	[illegible]	[illegible]						
	D	2	11	12	36	6	9	10	5	4		6	3	2						
Ayudhaya	C																	2		
	D																	1		
Bangkok	C		1	2	1			1			3	1								
	D		1	2	1			1			2									
Nagara	C																1			
Straits Settlements: Singapore	C			1	3		1													
	D			1	2		1													
Syria (see table below)																				
Tunisia [2]																				
Turkey: Constantinople	C	2																		
	D	1																		
Union of South Africa:																				
Cape Province	C	2		1																
	D	1		1																
Orange Free State	C	8		5	5	3	2													
	D	6		4	1	3	2													
Venezuela: State of Miranda—Tacata and Cua	C				P															
On vessel:																				
S. S. Cadwallen, at La Plata, from Rosario, Argentina	C		1																	
S. S. Aghios Gerasimos, at Vigo, Spain	C	3																		
S. S. Tymeric, at Barbados, from New Orleans	C															1				

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928
Algeria (see also table above):								
Algiers	C		2					1
Angola	C		3					
British East Africa (see also table above):								
Kenya	C	95	62	26	24	19	17	
	D						5	
Ecuador: Guayaquil	C	15	18	4	6	10		1
	D		5	4	3	1		
Plague-infected rats		34	31	23	31	21		1
Indo-China (French)	C	14	10	7		5	9	16
Kwangchow-Wan	C					18	17	10
Madagascar	C	314	692	427	342	171		
	D	286	605	388	317	159		
Ambositra Province	C	7	25	105	67	30		
	D	7	17	96	66	29		
Antsirabe Province	C	39	109	117	108	56		
	D	38	108	117	108	54		

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928
Madagascar—Continued.								
Itasy Province	C	36	104	33	19	3		
	D	41	94	29	17	3		
Moramanga Province	C	12	95	19	25	12		
	D	12	83	19	24	12		
Tananarive Province	C	211	408	155	123	70		
	D	189	354	129	102	61		
Mauritius	C	1						
Nigeria (see also table above)	C	32	63	16	16			
	D	29	61	16	16			
Peru	C	34	34		41	52		
	D	19	11		14	9		
Callao	D	3	3					
Lima	C		7	6				
	D		3					
Senegal (see also table above)	C			5	17	8	81	14
	D				13	4	40	5
Syria: Beirut	C		2					

[2] 8 cases of plague with 6 deaths were reported in Bengardane region, Tunisia, Mar. 17 to 27, 1928.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE RATS ON VESSELS

S. S. *Modemi* at Goteborg, Sweden, from Bahia and Buenos Aires via Cape Verde Islands, December 22, 1927.
S. S. *Gyderore* at Landskrona, Sweden, from Rosario via Canary Islands, January 22, 1928.
S. S. *Dryden* at Liverpool from La Plata River ports, January 20, 1928
S. S. *Sicily* at Liverpool from Buenos Aires and Rosario, June 8, 1928, 7 plague-infected rats.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928			April, 1928				May, 1928				June, 1928	
							17	24	31	7	14	21	28	5	12	19	26	2	9
Algeria (see also table below)	C	661	170	129	71	72	3				12								
Algiers	C		3	9	15	10		2	2	1		2		2	1	1	3		
Oran	C	20	39	29	11	5		2	10		3	1	2	11	4	1			
Angola (see table below).																			
Arabia: Aden	C	1	3	1		1													
Brazil (see also table below):																			
Rio de Janeiro	C	1					1												
	D	1					1												
British East Africa (see also table below):																			
Kenya—Mombasa	C							1		1				1					
Tanganyiki	D	P	P	8	5														
British South Africa:																			
Northern Rhodesia	C	185	252	236	233	297		54	8	5	26	7	4	591					
	D	64	62	31	23	42		9			1	1	1	48					
Southern Rhodesia	C	3	2	1	3	7	4	1	2		21	3			13				
	D					1					10								
Canada:																			
Alberta	C	10	10	11	27	10	7	20	7	13	4	2	3	3	13	10	18	1	
Calgary	C						1												
Edmonton	C	1	8	5	3	13	1	11	1	7	2			1	12	10			
British Columbia—Vancouver	C		4	8	26	10	2	5	6	4	11	6	1	6	4	2	5		1
Manitoba	C	19	7	11	1									7					
Winnipeg	C	2	2	2	2														
New Brunswick	C			1		1										1			
Ontario	C	264	347	212	243	147	19	39	20	9	6	18	18	8	15	12	6	8	
Hamilton	C		2																
Kingston	C	1		1	1						2		1						
Ottawa	C	134	63	60	68	22	6	8	10	2		3	1		4	2			1
Toronto	C	34	39	28	20	14	2	3	3	1	2	4	4	1	2	7		3	

Quebec	C	25	16	44	26	54	22	40	35	15	21	25	4	33	13	31	15	19	21
Montreal	C	1		8	8	9	6	3				6	2	1			1	2	3
Quebec	C		4	10	16	13	3	2	4	1	3	7	5	8	7	17	9	14	17
Riviere du Loup	C	3																	
Sherbrooke	C								3										
Saskatchewan	C	34	58	52	97	22	14	7		12	2	23	15	12	12	13	3		
Moose Jaw	C		1	4	11	13	2	5			3					1			
Regina	C	1	1						1	2	3	2		3	1				
Saskatoon	C		2	4	15	2													
Ceylon: Colombo	C	1	2		4	6				1									
	D		1		1			1											
China:																			
Amoy	C					1	1	2	1	2	3	2	1	3	1			1	
Antung	C			1								1		2					
Canton	C					2	3	2		2	1				1		1		
Chefoo	C		P				P												
	D					1													
Foochow	C	P	P	P	P	P				P	P	P	P	P					
Hong Kong	C			1	2	7	5	7	10	10	4	4	9	8	8	10	3	9	
	D			1	2	4		2	5	12	7	2	10	7	11	5	4	3	
Manchuria—																			
Changchun	C		1		4						2		1	1	3			3	
Dairen	C	2	1	5	15	13	1	3	5	6	7	3	6		12	10	13		
	D				8	7		3	5										
Fushun	C	1																	
Harbin	C		2	1	5	7	2	3		2	2	3	2						
Mukden	C	1			4	21			1			3	1					3	
Shanghai—																			
Foreigners only	C				5	6	1	1	3	2		1	1	1	2				
Including natives	D				11	19	2	1	3	3	3	1	3	2	1	7	5	6	
Tientsin	C	8	9	[illegible]	48	20	4	3	3	3	9	1	3	4					
Chosen (see table below)																			
Curacao (alastrim)	C				2	3													
Dominican Republic: Santo Domingo	C						2							1					
Dutch East Indies:																			
Borneo—																			
Pontianak	C					1													
Samarinda district	C	P																	
Java—																			
Batavia and West Java	C	25			4	2	4			1	1								
	D	15																	
East Java and Madura	C	9	9	5	2	9					1								
	D					1													
Sumatra—Medan	C		3	9	23	14	6			1	2			2					
	D		2	3	11	2	4			1	2			1					
Ecuador (see table below)																			
Egypt	C		4	4	1	2				52	11		1		1				
	D		1							33	6		1				1		
Cairo	C		2		1														
France (see table below)																			
Gold Coast (see table below)																			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

Place		Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended—												
							March, 1928			April, 1928				May, 1928				June, 1928	
							17	24	31	7	14	21	28	5	12	19	26	2	9
Great Britain:																			
England and Wales	C	902	1,041	1,175	1,530	1,473	359	342	322	318	321	326	376	321	319	336	258	286	
Birmingham	C				44	3	1				1								
Bradford	C	11	19	32	24	12	9		5	5	3	2	7	2	2	7	2	8	
Bristol	C	4	8		3	4		2	8	2	1	10	1	5	4	1	4	1	
Cardiff	C	1		1					5				1	2		1		1	
Castleford	C					4	2	16	7	11	27	11	20	11	11	6	4	3	
Leeds	C	5	16	11	3	9	3	5	3	3	2	2	1	1					
Liverpool	C			1		1													
London	C				4	14	10	5	1	1	7	5	3	27	5	10	5	5	
Manchester	C	6	25	5	25	8	4	3	3	4	2	4	2		1	1	2	1	
Newcastle on Tyne	C	9	55	22	27	12	3	4		2			4		1	6	3	2	
Nottingham	C			13	27	11	5	1	6	1	4	4	6	3	5	10		5	
Sheffield	C	6	9	14	8	6				1		10	2	2	2			2	
Stoke on Trent	C			4	1	15	11			1	4	10	5	13	9	8	6	1	
Greece (see table below)																			
India	C	4,052	6,731	10,676	17,777	18,850	6,004	6,169	3,101	7,760	8,789	8,038							
	D	927	1,650	2,429	3,709	3,826	1,212	1,207	1,500	1,621	1,988	1,739							
Bassein	C				1									1					
Bombay	C	4	9	14	61	149	49	58	62	49	56	57	54	33	46	37	26	27	
	D	3	2		24	73	24	33	36	27	32	34	27	25	25	22	18	13	
Calcutta	C	5	25	36	58	71	20	29	45	40	49	51	31	40	41	29	31	29	
	D	2	11	27	34	50	15	21	33	35	32	42	21	35	30	26	23	22	
Karachi	C					1	1							2			3		
	D					1								1			1		
Madras	C	7	11	21	74	100	30	27	45	81	49	36	60	24	17	22	11	9	
	D	2	3	6	8	19	5	3	6	15	16	8	7	7	5	5		5	
Negapatam	C			5	8	3					1		5	1	3	4	1		
	D			3	3						1		2			1			
Rangoon	C	6	14	136	275	377	96	82	92	50	62	45	37	23	15	2	6	7	
	D	1	4	31	64	104	28	17	34	23	24	17	12	16	4	2	2	5	
Tuticorin	C														3				
Vizagapatam	C			3	10	2			3			2			2		1		
	D				8												1		
India (French):																			
Chandernagor	C									5									
	D									1									

	C	42	41	50	47	9		6	5	7	12		15	9	16		7	9	
	D	42	41	50	47	9		6	5	7	12		15	9	16		6	1	
Indo-China (see also table below):																			
Saigon	C		1	3		3													
Iraq:																			
Baghdad	C	5	25	23	19	7	3	1		1	1	3		1	6		3	7	3
	D	4	14	12	11	4	3	1			1	1		1	1		2	3	1
Basra	C	3	4	2	1	7	4	1				1	1	2		1	2		
	D	1	3	1			1	1				1	1			1	2		
Italy:																			
Leghorn	C					1	1												
Palermo	C								3	2	1	3	3	3	2		4		
Rome and vicinity	C				3														
Jamaica (outside Kingston) (alastrim)	C	7	3	2	5	10	3	2	1	7		1	2	1			1		
Japan:																			
Kobe	C															6	3	1	
Nagoya	C												1	5	2				
Tokyo	C				4	4	1	3	1	10	8								
	D				1	2				1	1								
Tokyo Prefecture	C							17	5	2	1								
	D									1	1	1							
Yokohama	C												1	1	1		1		
Latvia (see table below).																			
Mauretania	C					P													
Mexico (see also table below):																			
Acapulco	C	1																	
	D	1																	
Chihuahua	D			1															
Jalisco (State)	C					P	P	P	P	P	P	P	P						
Guadalakara	D		2			1				2	2	1	4	5	7	4		2	4
Manzanillo	D			1			1												
Mazatlan	D															2		1	
Mexico City and surrounding territory	C		4		2	2							1		1		1		
Saltillo	D														1	1			
Tampico	C					1													
Morocco (see table below):																			
Nigeria (see also table below):																			
Lagos	C									1									
Southern Provinces	C					7		40	26	27									
	D							28	1	6									
Palestine: Jerusalem	C		1		1														
	D				1														
Persia (see table below).																			
Poland	C		1	6	3	1	1					5	2	2					
	D											1							
Portugal (see also table below):																			
Lisbon	C	4	10	12	12	20			2	3		3	2	1					
	D		1			1													
Oporto	C												1						
Senegal (see also table below):																			
Dakar	C					34	17			12	5	11			12	7			
	D						12			8		8			4	3			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

Place		Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928 17	24	31	April, 1928 7	14	21	28	May, 1928 5	12	19	26	June, 1928 2	9
Siam	C	1	9	23	35	12		2	14	12	1		3						
	D		1	2	4	3			4		1		1						
Bangkok	C	1	1	3									1						
	D			1															
Spain (see also table below):																			
Malaga	D	1	1																
Seville	C			1															
Valencia	C			2		1		1	1										
Straits Settlements. Singapore	C	1			1	1	1				2	1							
Sudan (Anglo-Egyptian)	C			4	85	109	10	28	250	54	29	18	78	35	39	7	75		
	D			4	48	27	7	8	75	10	6	8	4	14	4	1	6		
Sudan (French) (see table below).																			
Switzerland	C			2															
Syria (see table below).																			
Tunisia: Tunis	C			4	3	14	1		1	2		4		2		1			
Union of South Africa:																			
Cape Province	C				P														
Natal	C				P	P	P	P	P										
Orange Free State	C	P	P	P	P				P										
Transvaal	C	1											P						
Union of Soviet Socialist Republics (see table below).																			
Upper Volta	C					5		2			P		4	5					
Venezuela:																			
Maracaibo	D				1	1													
On vessel:																			
S. S. Arendskerk at Singapore, from Amoy, China	C								P										
S. S. Kashgar at Kobe, from Shanghai	C													P					
S. S. Rohna at Penang from Negapatam	C																P		
S. S. Tjileboet at Hong Kong, from Shanghai	C													P					
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C									1									

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928 1-10	February, 1928 11-20	February, 1928 21-29	March, 1928 1-10	March, 1928 11-20	March, 1928 21-31	April, 1928 1-10	April, 1928 11-20	April, 1928 21-30	May, 1928 1-10	May, 1928 11-20	May, 1928 21-31
Algeria (see also table above)	C	1,217	682													
Oran	C	51	11													
Indo-China (French) (see also table above)	C	68	97	58	50	31	90	57	71	69		35		36	6	37
Ivory Coast	C														7	
Senegal (see also table above)	C											51				
	D											7				
Dakar	C											11		12	7	
	D											8		4	3	
Sudan (French)	C			4		5	1	P.	5			4		30	P.	
	D													6		
Syria:																
Aleppo	C		1	1												
Beirut	C		2	15	11	26		12	7	4	3	5	1	2	3	
	D									2	1					
Damascus	C		47	13					1							

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928
Angola	C	51	151	10	36			
	D		2					
Congo	C	5	77		36			
Cuanza-Norte	C	1				1		
Cuanza-Sul	C		9	10				
Loanda	C	1						
Zaire	C	3	5					
Brazil (see also table above)								
Porto Alegre	C	11	5		1			
British East Africa (see also table above):								
Zanzibar	C		2					
	D		1					
Chosen	C	21	4	4	21	23		
	D	6	1	2	8	6		
Seoul	C					1		
Ecuador. Guayaquil	C	4	6	2	9	24	19	31
	D					1		
France	C	37	25	11	10	13	6	

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May 1928
Gold Coast	C	7	4		1	3		
Greece	C	10	9	6	11	19		
	D				2	2		
Latvia	C		2		1			
Mexico (see also table above)	D	221	346	256				
Morocco	C	180	622	55	47	30	19	
Nigeria (see also table above)	C	820	316	275	217			
	D	173	81	39	45			
Persia	D		2	7				
Portugal (see also table above)	C			143	115			
	D			22	8			
Spain (see also table above):								
Madrid	D		1					
U. S. S. R.								
Railways, etc.	C	26	33	18	20			
Other territories in Europe	C	366	1,256		998			
Transcaucasus, Siberia, and Central Asia	C	80	81					
Ukraine	C	27	48	6	11			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 22, 1927	Oct. 23–Nov. 19, 1927	Nov. 20–Dec. 17, 1927	Dec 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Week ended— March, 1928			April, 1928				May, 1928				June, 1928		
								17	24	31	7	14	21	28	5	12	19	26	2	9	16
Algeria (see also table below):																					
Algeria	C					1	3	1	1	2	5	1	3			1	1	2			
	D						1						2								
Oran	C				4	2	10	1		2	1	1	6	2	2	1		3			
	D												1								
Austria: Vienna	C					1															
Bulgaria (see also table below):																					
Sofia	C	17	6	1	6	1		3		3	14				1	1		9			
	D		1																		
Chile:																					
Antofagasta	D	1																			
Talcahuano	D								1												
Valparaiso	C		1	2	1		1														
	D		2																		
China (see also table below):																					
Manchuria—																					
Dairen	C											7		3							
Harbin	C		1										1	1							
Chosen (see table below)																					
Czechoslovakia (see table below)																					
Egypt	C	12	4	14	8	9	17		1	1		2	1				11				
	D	5		8	4	2	8		1								2				
Cairo	C			3							2	3			1						
	D			3							1	3			1						
Port Said	C	1		1																	
Behera Province	C										29	23			2	7	5	15			
	D											4				3	1				
Gharbieh Province	C										23	5		5	4	1	2				
	D											3		2							
Keneh Province	C										5	29		9							
	D											1		6							
Menoufieh	C													5	23	5	1				
	D													1	2		1				

Greece (see table below)																					
Ireland (Irish Free State)	C					1						1							4		
Cork County	C			3	1																
Donegal County, Letterkenny	C	4																			
Japan (see table below)																					
Latvia (see table below)																					
Lithuania (see table below)																					
Mexico (see also table below):																					
Guadalajara	D			1																	
Mexico City, including municipalities in Federal District	C	18	28	17	15	5	8	6	6			4		4		7	4	4			
	D		2	1	5		4		3					1							
Monterey	D								1												
Morocco (see table below)	C				32	1,051	316	172	167	219	190	186	167	136	102	62	63	72			
Palestine	C	5	3	9	8	5	10	5			2	3		1	2	2	1	1		2	1
Peru (see table below)																					
Poland	C	19	64	93	195	346	265	90	90	125	77	93		71	80	90					
	D	4	11	10	16	19	28	5	6	7	7	8		2	2	7					
Portugal (see table below). Oporto	C		1			1															
Rumania	C	17	22	35	68	39	68	29	34	33	45	36	38	30	38	39					
	D	2			3	9	5	2	2	3	4		6	5	1	1					
Syria (see also table below): Aleppo	C				2																
Tunisia	C	3	1	1	6	4	1	13		5			2	16	1	3					
Union of South Africa:																					
Cape Province	C	P	P	P	1	1	P		P	P	P	P	P	P	P						
Natal	C	P	P	2	3	1	2	P	P	P		P	P	P	P						
Orange Free State	C	P		P		P			P	P	P	P	P	P	P						
Transvaal	C	5	P	P					P	P											
Union of Soviet Socialist Republics (see table below)																					
Yugoslavia (see table below)																					
On vessel S. S. Gaika at Durban, Natal, from Mauritius	C						1														

Place		1927		January, 1928			February, 1928			March, 1928			April, 1928			May 1-10 1928
		July-September	October-December	1-10	11-20	21-31	1-10	11-20	21-29	1-10	11-20	21-31	1-10	11-20	21-30	
Algeria (see also table above)	C	110	12													
	D	13	1													
Algiers	C	10	2													
Bulgaria (see also table above)	C	43	4	7	6		8	12	6							26
	D	3	2		1		1	2	2							
Morocco (see also table above)	C	231	123													

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

Place		July-September, 1927	October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928
China (see also table above): Shanghai	D		1				
	C	90	80	183	400	313	
Chosen	D	8	6	19	44	25	
Chemulpo	C	3		1		1	
Gensan	C	2		1			
	D			1			
Seoul	C	5	2			10	
	D	1	1			1	
Czechoslovakia	C	12	7			25	
Greece: Athens	C	3	1	2	2		13
	D						2
Japan	C	1	1				
Latvia	C	6			1	26	
Lithuania	C	69	54	86	137		
	D	14	3	10	12		
Mexico (see also table above)	D	64	98	46			
Peru:							
Arequipa	D	3	3	2			1
La Oroya	C			P	P	P	
Lima	C	8					
Turkey	C				17		
	D				1		
Union of Soviet Socialist Republics:							
Railways, etc.	C	77	102	41	107		
Transcaucasus, Siberia, and Central Asia	C	208	190	7			
Ukraine	C	295	631	533	459		
Other territories in Europe	C	1,839	1,924		1,853		
Yugoslavia	C	20	2	7	24	3	10
	D	5		3			1

YELLOW FEVER

Place		Aug 28-Sept 24, 1927	Sept. 25-Oct 22, 1927	Oct. 23-Nov. 19, 1927	Nov. 20-Dec. 17, 1927	Dec 18, 1927-Jan 14, 1928	Jan. 15-Feb. 11, 1928	Feb 12-Mar. 10, 1928	Week ended— March, 1928: 17	24	31	April, 1928: 7	14	21	28	May, 1928: 5	12	19	26	June, 1928: 2	9	16	23
Belgian Congo: Boma	C					3																		
	D					2																		
Matadi	C					29	14	1												2			
	D					16	13																
Brazil: Bahia	C							1															3
Estancia	C																			2			
Rio de Janeiro	D																			2			

...oast (see table below)																							
Coast	C					1																	
	D					1																	
...a: Monrovia	C	1																					
...eria	C	2																					
	D	2																					
...negal	C	21	31	38																			
	D	21	31	28																			
Dakar	C		12	14	7	2																	
	D		7	10	7	2																	

Place		July	August	September	October	November	December	January	February	March	April	May
...old Coast	C	15	2	6	1							1
	D	4	2	4	1							